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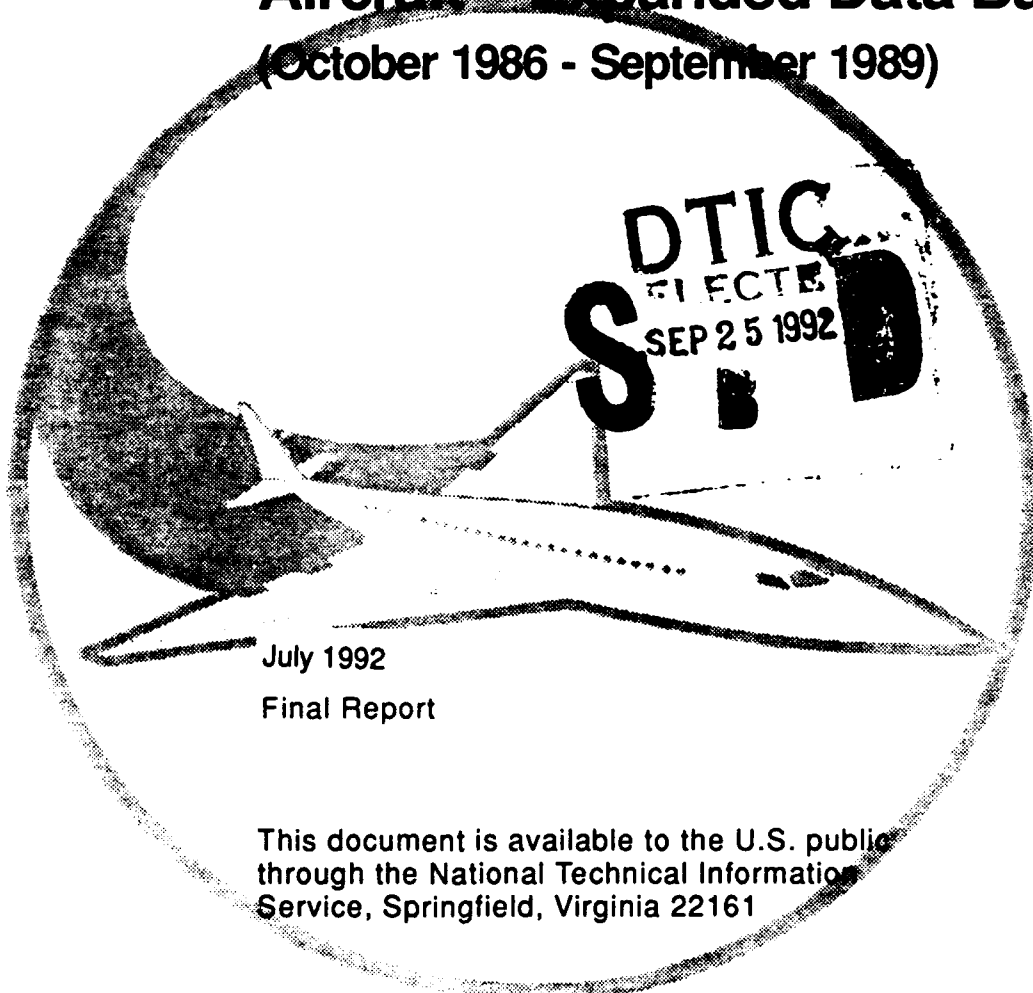


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DOT/FAA/CT-91/32

FAA Technical Center
Atlantic City International Airport
N.J. 08405

Engine Bird Ingestion Experience of the Boeing 737 Aircraft - Expanded Data Base (October 1986 - September 1989)



July 1992
Final Report

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16. Abstract ✓ DOT/FAA/CT-89/16 covers the period from October 1986 to September 1987 DOT/FAA/CT-89/29 covers the period from October 1986 to September 1988 DOT/FAA/CT-90/28 covers the period from October 1986 to September 1989 The Federal Aviation Administration (FAA) Technical Center initiated a study in October 1986 to determine the numbers, weights, and species of birds which are being ingested into medium and large inlet area turbofan engines and to determine what damage, if any, results. Bird ingestion data were collected for the Boeing-737 model aircraft which uses either the Pratt and Whitney JT8D medium inlet area turbofan engine or the CFM International CFM56 large inlet area turbofan engine. This report analyzes the entire 3 years of data collected by the engine manufacturers, the FAA, and the International Civil Aviation Organization (ICAO) during the period from October 1986 through September 1989.					
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FOREWORD

This final report provides descriptive and statistical analyses of the data collected over a 3-year period on bird ingestion experiences for the B737 aircraft. The data described in this report were collected under separate Federal Aviation Administration (FAA) contracts with the engine manufacturers, by the FAA, and by the International Civil Aviation Organization (ICAO). This is the second report on the 3-year data collection period. At the time when the first report (number DOT/FAA/CT-90/28) was prepared, the ICAO bird ingestion data were not available for the full 3-year period. This report represents an update of the first report with the ICAO data included in the descriptive and statistical analyses.

The report was prepared by the University of Dayton under Department of Transportation, Federal Aviation Administration Contract DTFA03-88-C-00024. The principal investigator at the University of Dayton was Dr. Peter W. Hovey, and computer support was provided by Mr. Donald A. Skinn. Mr Joseph Wilson was co-author and the technical project monitor for the FAA during the preparation of the report.

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TABLE OF CONTENTS

<u>SECTION</u>	<u>PAGE</u>
EXECUTIVE SUMMARY	xi
1 INTRODUCTION	1
1.1 Background	1
1.2 Objectives	1
1.3 Organization of Report	2
2 AIRCRAFT OPERATIONS AND AIRPORT OPERATIONS	3
3 CHARACTERISTICS OF INGESTED BIRDS	10
4 INGESTION RATES	23
4.1 Ingestion Rate Estimates	23
4.2 The Poisson Process	27
4.3 Validity of the Poisson Process Model for Bird Ingestions	30
4.4 Inlet Area Effect on Ingestion Rates	37
5 AIRPORT BIRD INGESTION EXPERIENCE	40
6 ENGINE DAMAGE DESCRIPTION	62
6.1 Engine Damage and Crew Action Descriptions	62
6.2 Probability of Damage	71
6.3 Crew Action and Engine Shutdown Probabilities	75
6.4 Engine Failures	75
7 PROBABILITY ESTIMATES	80
8 DATA QUALITY	87
8.1 Data Sources	87
8.2 Internal Consistency	87
9 CONCLUSIONS	94
10 REFERENCES	96
11 GLOSSARY	98

APPENDICES

A - Airports with Scheduled Boeing-737 Flights and/or Reported
Bird Ingestion Events

B - Contents of FAA Bird Ingestion Data Base Boeing-737 Airplane

C - Statistical Hypothesis Testing

LIST OF ILLUSTRATIONS

<u>Figure</u>	<u>Page</u>
E-1 737 Aircraft Engine Bird Ingestion Study Data Summary	xiii
2.1 Histogram of Monthly Aircraft Operations by Engine Type	9
3.1 Contour Map of Domestic Aircraft Ingestion Events	11
3.2 Histogram of Bird Ingestion Events by State	12
3.3 Histogram of Number of Birds Ingested by Weight Class	18
3.4 Histogram of Monthly Worldwide Aircraft Ingestion Events	20
3.5 Histogram of Seasonal Aircraft Ingestion Rates	21
3.6 Histogram of Aircraft Ingestion Events by Time of Day	22
4.1 Histogram of Monthly Aircraft Ingestion Rates by Engine Type (Normalized for Inlet Area)	26
4.2 Comparison of Observed and Predicted CDFs for United States JT8D Aircraft Ingestion Events	31
4.3 Comparison of Observed and Predicted CDFs for Contiguous United States JT8D Aircraft Ingestion Events	32
4.4 Comparison of Observed and Predicted CDFs for Foreign JT8D Aircraft Ingestion Events	33
4.5 Comparison of Observed and Predicted CDFs for United States CFM56 Aircraft Ingestion Events	34
4.6 Comparison of Observed and Predicted CDFs for Contiguous United States CFM56 Aircraft Ingestion Events	35
4.7 Comparison of Observed and Predicted CDFs for Foreign CFM56 Aircraft Ingestion Events	36
5.1 Histogram of Aircraft Ingestion Events at Domestic Airports	50
5.2 Histogram of Aircraft Ingestion Events at Foreign Airports	52
6.1 Estimated POD Function for Any Damage with the 95 Percent Confidence Bound	74
6.2 Estimated POD Function for Moderate or Worse Damage with the 95 Percent Confidence Bound	74
6.3 Estimated POD Function for Severe Damage with the 95 Percent Confidence Bound	74

LIST OF ILLUSTRATIONS (Continued)

<u>Figure</u>	<u>Page</u>
8.1 Comparison of the United States Bird Weight Distributions for the First, Second, and Third Years	91
8.2 Comparison of the Foreign Bird Weight Distributions for the First, Second, and Third Years	92

LIST OF TABLES

<u>Table</u>	<u>Page</u>
2.1 Scheduled OAG Airport Operations by Seasonal Month	5
2.2 Scheduled OAG Airport Operations by Season	6
2.3 OAG Airport Operations by Month	7
2.4 Scheduled Aircraft Operations by Engine Type	8
3.1 Tally of Positively Identified Bird Species Broken Down by US, Foreign, and Overall	13
3.2 Weight Distribution of Ingested Birds by Origin	15
3.3 Summary Statistics for Ingested Bird Weights	19
4.1A Breakdown of Bird Ingestion Rates by Engine and Location (Based on Aircraft Operations)	24
4.1B Breakdown of Bird Ingestion Rates by Engine and Location (Based on Engine Operations)	25
4.2A Ingestion Rates for Engine Type by Phase of Flight (Based on Aircraft Ingestion Events)	28
4.2B Ingestion Rates for Engine Type by Phase of Flight (Based on Engine Ingestion Events)	29
4.3 Results of the Exponential GOF Tests to Verify the Poisson Process	38
5.1 Frequency Count of Aircraft Ingestion Events by Airport and Phase of Flight	42
5.2 Airport Bird Ingestion Rates	59
6.1 Definition of Engine Damage Categories	63
6.2 Types of Damage Caused by Bird Ingestions	64
6.3 Tally of Positively Identified Bird Species by Weight Range and Event Type	66
6.4A 737 Aircraft Engine Bird Ingestion Damage Summary (Total Bird Events)	67
6.4B 737 Aircraft Engine Bird Ingestion Damage Summary (Single Bird Events)	68
6.4C 737 Aircraft Engine Bird Ingestion Damage Summary (Multiple Bird Events)	69

LIST OF TABLES (Continued)

<u>Table</u>	<u>Page</u>
6.5 Phase-of-Flight (POF) Analysis	70
6.6 Aircraft Airspeed Analysis	70
6.7 Multiple Engine and Multiple Bird Analysis	70
6.8 Damage Severity Definitions	73
6.9 Conditional Probability of Crew Action Given The Engine Damage Severity	76
6.10 Engine Failure Summary by Bird Weight	78
7.1 Aircraft Operation Ingestion Probabilities	81
7.2 Aircraft Operation Ingestion Probabilities by Location and Engine Type	82
7.3A Probability of Ingestion as a Function of Bird Weight by Location and Engine Type (Based on Aircraft Operations)	83
7.3B Probability of Ingestion as a Function of Bird Weight by Location and Engine Type (Based on Engine Operations)	84
7.4A Probability of Ingestion as a Function of Bird Weight by Location (Based on Aircraft Operations)	85
7.4B Probability of Ingestion as a Function of Bird Weight by Location (Based on Engine Operations)	86
8.1 Counts for United States and Foreign Aircraft Events and Aircraft Operations by Year and Engine	89
8.2 Chi-Squared Test Statistics for Comparing Annual Ingestion Rates	89
8.3 Comparison of Weight Distributions Between Birds Ingested in the First, Second, and Third Years	90

EXECUTIVE SUMMARY

An investigation was initiated by the Federal Aviation Administration (FAA) Technical Center in September 1986 to determine the numbers, weights, and species of birds which are ingested into medium and large inlet area turbofan engines during worldwide service operation and to determine what damage, if any, results. This report summarizes the three years of Boeing-737 (B737) data that were collected by the engine manufacturers, the FAA, and the International Civil Aviation Organization (ICAO) as part of a separate data collection.

This report includes the ICAO data in the statistical analysis. The previous report (report number DOT/FAA/CT-90/28 [1]) was based only on the three years of data collected by the engine manufacturers and the FAA because only the first two years of ICAO data were available. Previous reports covered just the first year of data (report number DOT/FAA/CT-89/16 [2]) and the first two years of data (report number DOT/FAA/CT-89/29 [3]).

The main difference between this report and the previous report is that there is a substantial increase in the number of foreign bird ingestion events that were reported. There was no change in the total number of B737 operations so that an increase in reported ingestion events results in an increase in estimated ingestion rates and probabilities for foreign operations. The statistical tests that were performed throughout the report were not significantly affected by the increased data.

Figure E-1 is an overall summary of the data that were collected during the 3 years of this investigation which extended from October 1986 through September 1989. A total of 8.91 million aircraft operations were flown by B737 commercial aircraft during the 3-year period. B737 aircraft equipped with Pratt and Whitney JT8D medium inlet area turbofan engines accounted for 71.8 percent of these flights. The remaining 28.2 percent of the flights were made by B737 aircraft having CFM International CFM56 large inlet area turbofan engines.

During the three years of data collection, birds were ingested by one or both engines during 1,410 aircraft operations which yields a probability of aircraft ingestion of 1.58×10^{-4} . One or more birds were ingested into both engines of the aircraft during 58 of the 1,410 aircraft ingestion events. Thus, a total of 1,468 engine ingestion events were reported during the data collection period. There were 17.82 million engine operations during this period which yields a probability of engine ingestion of 8.24×10^{-5} . A conclusion of these data is that bird ingestion events are rare, but probable events.

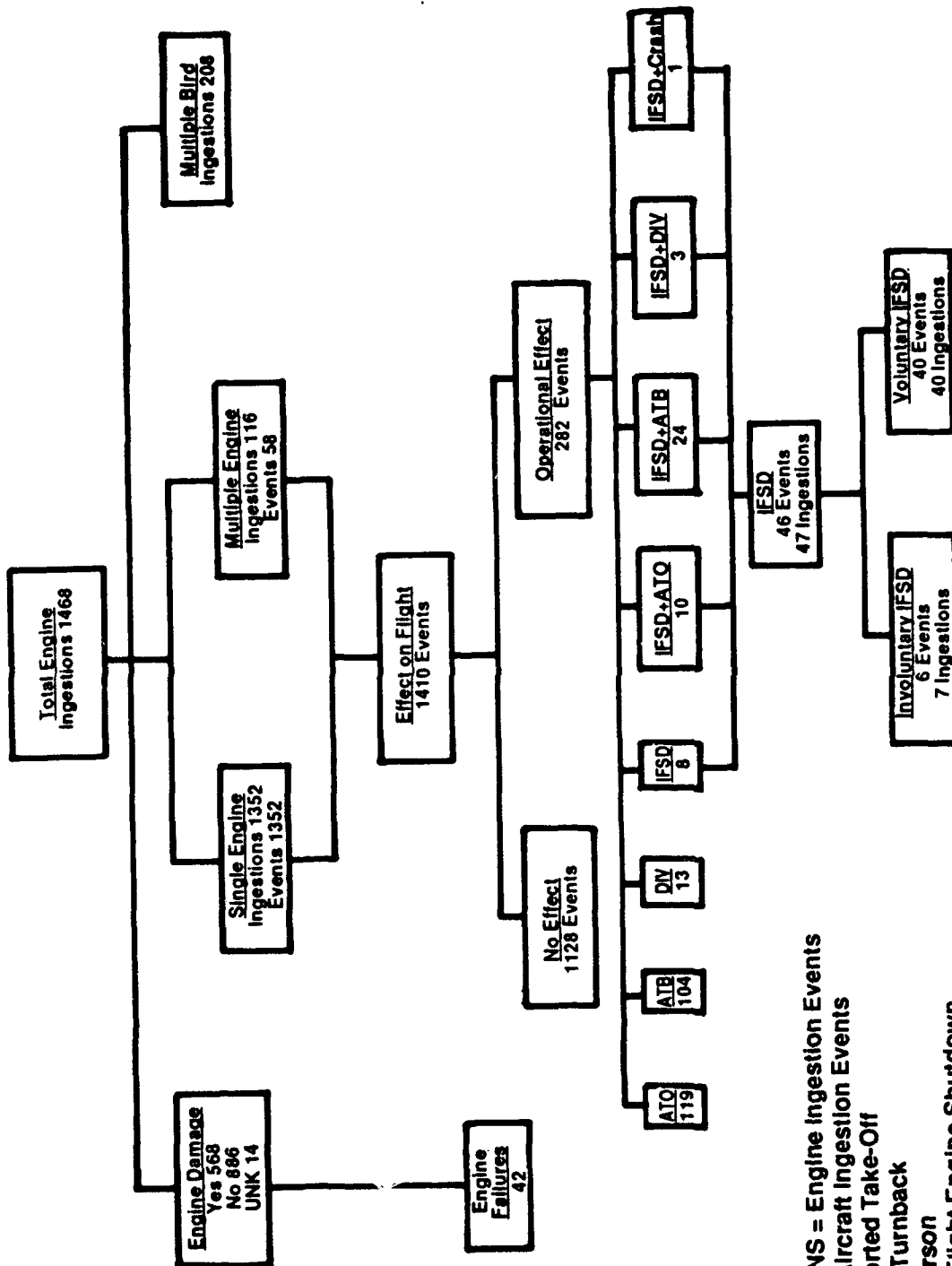
The species of the ingested bird was reliably identified 253 times. The order charadriiformes (shorebirds) was most frequently represented with 99 ingested birds. The majority of ingested birds (238) weighed 40 ounces or less. The bird weight distribution of ingested birds in the United States was different from the distribution in foreign countries. The median bird weight in the United States was 4 ounces higher than abroad; however, the domestic mean bird weight was 1.9 ounces lower than abroad. The bird ingestion rate within the United States was significantly lower than the foreign bird ingestion rate.

The majority of engine ingestion events (1,208 of 1,468) involved a single bird and a single engine on the aircraft. The remaining 260 engine ingestion events involved 144 single engine, multiple bird events, 23 dual engine, single bird aircraft ingestion events (46 engine ingestion events), or 35 dual engine, multiple bird aircraft ingestion events (70 engine ingestion events). Multiple birds were ingested in both engines in 29 of the 35 dual engine, multiple bird aircraft ingestion events which resulted in 208 multiple bird engine ingestion events. There were a total of 58 dual engine aircraft ingestion events which when combined with the 144 single engine, multiple bird engine ingestion events totaled to 202 aircraft ingestion events involving multiple engines and/or multiple birds.

Engine damage occurred in 39 percent of all engine ingestion events, and there were 180 engine ingestions that resulted in engine damage classified as moderately severe or worse. The majority of bird ingestions resulted in little or no engine damage.

The majority (856 of 1054) of aircraft ingestion events, for which the phase of flight was known, occurred within the airport environment during takeoff and landing. The probability of engine damage is greater when the bird ingestion occurs during the takeoff and climb phases of flight than when it occurs during approach and landing. Aircraft airspeed at or above 140 knots also increases the probability of engine damage.

It was determined that 2.9 percent of all engine bird ingestion events resulted in an engine failure. Eight engine failures were caused by birds that weighed less than or equal to 1 pound. Engine failures are also more likely to occur when multiple birds are ingested into an engine.



INGESTIONS = Engine Ingestion Events
 Events = Aircraft Ingestion Events
 ATO = Aborted Take-Off
 ATB = Air Turnback
 DIV = Diversion
 IFSD = In-Flight Engine Shutdown

Figure E-1. 737 AIRCRAFT ENGINE BIRD INGESTION STUDY
 DATA SUMMARY
 (3 YEARS OF DATA, 10/86 TO 9/89)

The following summary shows the most pertinent statistics extracted from the three years of data for the B737 aircraft:

Median Bird Weight (oz)* Worldwide	10.0
Mode Bird Weight (oz)** Worldwide	40.0
Probability of Ingestion Per Aircraft Operation	
Worldwide	1.58×10^{-4}
United States	0.63×10^{-4}
Foreign	2.70×10^{-4}
Most Commonly Ingested Bird	
United States	Dove/Gull
Foreign	Gull/Lapwing
Engines Experiencing Moderate/Severe Damage	180
Multiple Bird, Engine Ingestion Events	208
Dual Engine Aircraft Ingestion Events	58
Dual Engine, Multiple Bird Aircraft Ingestion Events	35
Single Engine, Multiple Bird Aircraft Ingestion Events	144
Aircraft Ingestion Events By Phase-of-Flight	
Takeoff and Climb Phase-of-Flight	60.7%
Approach and Landing	36.7%
Airports Reporting Bird Ingestions	409
Ratio of Reported Events to Aircraft Operations	
United States	0.63×10^{-4}
Foreign	2.70×10^{-4}

* Divides the weights into two groups with half the weights below the median and half above.

** The weight that has the highest frequency.

SECTION 1 INTRODUCTION

1.1 BACKGROUND.

Contention for airspace between birds and airplanes has created a serious bird/aircraft strike hazard. Past studies [1,2,3,4] have indicated that birdstrikes to engines are statistically rare events. The probability of a birdstrike during any given flight is extremely low; however, when the number of flights is considered, the number of birdstrikes becomes significant.

The windshield and the engines are particularly vulnerable to the birdstrike threat. Although penetration of the windshield by a bird is primarily a concern for military airplanes operating at high speeds in a low-altitude environment, such a penetration has occurred on a civilian airplane resulting in the death of the co-pilot. Ingestion of birds into turbine engines is a safety problem for commercial as well as military airplanes for it can cause significant damage to the engine resulting in degraded engine performance and very possibly failure.

In their studies of bird ingestions on commercial flights, both Hovey [1,2,3] and Frings [4] indicated that nearly all bird ingestion events have occurred in the vicinity of airports during the non-cruise phases of flight. This is understandable because these phases of flight naturally occur closer to the ground where bird concentrations are higher, resulting in a higher probability of birdstrike.

The solutions to the problem of engine damage resulting from bird ingestion are similar to those for windshield birdstrike, e.g., structural design consideration to withstand impact or bird avoidance. Bird avoidance can be facilitated by either of two approaches: (1) keeping airplanes out of airspaces with large bird concentrations, and (2) removing birds from these regions of airspace. The bird avoidance approach can have various degrees of success or failure for commercial air fleets because flight schedules place airplanes in specific areas at specific times and the effectiveness of airport bird control programs (if any) varies from airport to airport and country to country.

Structural design of engines to withstand bird ingestions can be accomplished provided that requirements with respect to bird weights and numbers can be identified. Bird ingestion data for medium/large inlet area turbofan engines and small inlet area turbine engines [5,6] have been collected by several engine manufacturers. Statistical evaluation of bird ingestion data from these data collection efforts and previous bird ingestion studies will be useful in re-evaluating certification test criteria specified in Federal Aviation Administration (FAA) Regulation 14 CFR 33.77. As a result, future turbine engines can be designed to withstand more realistic bird threats.

1.2 OBJECTIVES.

The objective of this report is to determine the relationship of bird weight, number of birds ingested, geographic location, season, time of day,

phase of flight, and engine type to the frequency of bird ingestion events and the extent of engine damage, if any, resulting from the ingested birds. The statistical analysis of reported bird ingestions experienced by commercial B737 aircraft worldwide over a 3-year reporting period is used to summarize the service threat and level of engine damage experienced by these aircraft. The findings of the analysis will be helpful in defining minimum engine design requirements for resistance to damage as a result of bird ingestions. Moreover, this study will provide a comparison between the experiences of a contemporary high bypass ratio turbofan engine (CFM56) and an older low bypass ratio turbofan engine with a smaller inlet (JT8D) exposed to similar aircraft-bird ingestion environments.

This is the second report on the 3-year data collection period. There were three major sources of bird ingestion data for the 3-year period: the engine manufacturers, the FAA, and the ICAO. At the time the first report was prepared, the data from ICAO were not available for the full 3-year period. This report represents an update of the first report with the ICAO data included in the analyses.

1.3 ORGANIZATION OF REPORT.

Section 2 defines, discusses, and differentiates airport operations and aircraft operations. Section 3 identifies the characteristics of bird species that have been ingested and reliably identified. Section 4 describes bird ingestion rates by location, engine type, and phase of flight. Section 5 provides a geographic placement of bird ingestion events throughout the world. Section 6 summarizes engine damage resulting from bird ingestions. Section 7 examines the probabilities of various bird ingestion events. Section 8 summarizes the changes in the second edition and discusses the quality of the data collected in this study by examining the sources of the data and evaluating the consistency of the data from the first year to the third year. Section 9 provides a summary of the results obtained from this data analysis. Section 10 provides literature references. Section 11 is a glossary of terms.

SECTION 2

AIRCRAFT OPERATIONS AND AIRPORT OPERATIONS

Aircraft operations and airport operations data are used to determine bird ingestion rates. Operations data (and their sources) used to generate bird ingestion rates are discussed in this section. Definitions are provided to aid in understanding these data.

An aircraft operation as defined in the glossary is a nonstop flight from one airport (departure airport) to another airport (arrival airport) and consists of seven phases of flight which include: (1) taxi-out, (2) takeoff, (3) climb, (4) cruise, (5) approach, (6) landing, and (7) taxi-in. An airport operation is considered either a departure from or an arrival at an airport. When all scheduled flights are considered, the number of airport operations is twice the number of aircraft operations.

The Official Airline Guide (OAG) is the data source for scheduled airport operations. Counts of airport operations involving B737 airplanes were extracted from OAG magnetic tapes and maintained by airport code. The counts were further categorized by month of year and hour of day so that seasonal and time of day analyses could be performed.

Table 2.1 presents the OAG airport operations counts by seasonal months for the 3-year period. The counts are also broken down by several geographic regions. Table 2.2 presents the same airport operations counts as Table 2.1; however, an adjustment for hemisphere has been made. It should be noted that the number of aircraft operations for each of these categories is one-half the number of airport operations. Frings [4] defines autumn in the Northern Hemisphere and spring in the Southern Hemisphere as the months September, October, and November. The collection period for each year of B737 data was October through the following September. Consistency with Frings is maintained in Table 2.1 and Table 2.2 by grouping operations counts for October and November with the operations counts of the following September.

Table 2.3 presents two cross tabulations of airport operations by month and OAG destination-arrival code. The first tabulation includes all airports at which one or more B737 operations were scheduled during the reporting period. The second tabulation is a subset of the first and includes only those airports at which a bird ingestion event was reported during the 3-year period. The destination-arrival code is taken directly from the OAG tapes and its values are presented as a footnote in Table 2.3.

A tabulation of aircraft operations by engine type and geographic region is required to obtain bird ingestion rates for these parameters. Table 2.4 presents a tabulation of B737 aircraft operations by engine type and geographic region for the reporting period. The OAG operations data identify implicitly the geographic region through the airport code and also identify explicitly whether the airplane is a B737; however, the engine type of the airplane is not reliably identified in the OAG data. The aircraft operations presented in the ALL ENGINES column of Table 2.4 are derived by dividing the airport operations in the TOTAL column of Table 2.1 by 2. The aircraft operations for the CFM56 engine were provided by the engine manufacturer as actual flights flown during the reporting period and are considered reliable.

Similar data were not available for the JT8D engine. The JT8D aircraft operations were therefore derived by subtracting the CFM56 aircraft operations from the total aircraft operations for both engines.

The engine manufacturers provided the FAA with a listing of monthly operations counts for their respective engine types; however, the counts did not agree with the OAG counts. Monthly percentages for each engine type were calculated from the engine manufacturer's data and subsequently applied to the JT8D and CFM56 engine totals in Table 2.4 to estimate monthly aircraft operations for the reporting period. Figure 2.1 is a histogram showing the estimated aircraft operations for each engine type.

TABLE 2.1 SCHEDULED OAG AIRPORT OPERATIONS BY SEASONAL MONTH
(OCTOBER 1986 THROUGH SEPTEMBER 1989)

<u>Geographic Location</u>	<u>SEASONAL MONTHS</u>				<u>Total</u>
	<u>Mar-May</u>	<u>Jun-Aug</u>	<u>Sep-Nov</u>	<u>Dec-Feb</u>	
Contiguous US					
Oct'86-Sep'87	728,180	762,922	685,560	681,306	2,857,968
Oct'87-Sep'88	758,076	775,265	758,049	756,956	3,048,346
Oct'88-Sep'89	<u>815,708</u>	<u>838,195</u>	<u>791,297</u>	<u>777,947</u>	<u>3,223,147</u>
Three Year Total	2,301,964	2,376,382	2,234,906	2,216,209	9,129,461
United States					
Oct'86-Sep'87	771,231	807,492	726,309	722,461	3,027,493
Oct'87-Sep'88	801,058	819,890	800,388	798,613	3,219,949
Oct'88-Sep'89	<u>862,495</u>	<u>889,311</u>	<u>836,328</u>	<u>822,768</u>	<u>3,410,902</u>
Three Year Total	2,434,784	2,516,693	2,363,025	2,343,842	9,658,344
Foreign					
Oct'86-Sep'87	619,425	647,640	604,935	591,679	2,463,679
Oct'87-Sep'88	688,874	722,608	668,398	650,891	2,730,771
Oct'88-Sep'89	<u>747,501</u>	<u>778,335</u>	<u>730,340</u>	<u>712,736</u>	<u>2,968,912</u>
Three Year Total	2,055,800	2,148,583	2,003,673	1,955,306	8,163,362
Northern Hemisphere					
Oct'86-Sep'87	1,235,767	1,296,951	1,181,268	1,166,794	4,880,780
Oct'87-Sep'88	1,314,164	1,357,068	1,295,982	1,277,954	5,245,168
Oct'88-Sep'89	<u>1,413,677</u>	<u>1,456,381</u>	<u>1,370,619</u>	<u>1,344,256</u>	<u>5,584,933</u>
Three Year Total	3,963,608	4,110,400	3,847,869	3,789,004	15,710,881
Southern Hemisphere					
Oct'86-Sep'87	154,889	158,181	149,976	147,346	610,392
Oct'87-Sep'88	175,768	185,430	172,804	171,550	705,552
Oct'88-Sep'89	<u>196,319</u>	<u>211,265</u>	<u>196,049</u>	<u>191,248</u>	<u>794,881</u>
Three Year Total	526,976	554,876	518,829	510,144	2,110,825
Worldwide					
Oct'86-Sep'87	1,390,656	1,455,132	1,331,244	1,314,140	5,491,172
Oct'87-Sep'88	1,489,932	1,542,498	1,468,786	1,449,504	5,950,720
Oct'88-Sep'89	<u>1,609,996</u>	<u>1,667,646</u>	<u>1,566,668</u>	<u>1,535,504</u>	<u>6,379,814</u>
Three Year Total	4,490,584	4,665,276	4,366,698	4,299,148	17,821,706

TABLE 2.2 SCHEDULED OAG AIRPORT OPERATIONS BY SEASON
(OCTOBER 1986 THROUGH SEPTEMBER 1989)

<u>Geographic Location</u>	<u>SEASONS OF THE YEAR</u>			
	<u>Spring</u>	<u>Summer</u>	<u>Autumn</u>	<u>Winter</u>
				<u>Total</u>
Contiguous US				
Oct'86-Sep'87	728,180	762,922	685,560	681,306
Oct'87-Sep'88	758,076	775,265	758,049	756,956
Oct'88-Sep'89	815,708	838,195	791,297	777,947
Three Year Total	2,301,964	2,376,382	2,234,906	2,216,209
United States				
Oct'86-Sep'87	771,231	807,492	726,309	722,461
Oct'87-Sep'88	801,058	819,890	800,388	798,613
Oct'88-Sep'89	862,495	889,311	836,328	822,768
Three Year Total	2,434,784	2,516,693	2,363,025	2,343,842
Foreign				
Oct'86-Sep'87	614,512	636,805	609,848	602,514
Oct'87-Sep'88	685,910	708,728	671,362	664,771
Oct'88-Sep'89	747,231	758,318	730,610	732,753
Three Year Total	2,047,653	2,103,851	2,011,820	2,000,038
Northern Hemisphere				
Oct'86-Sep'87	1,235,767	1,296,951	1,181,268	1,166,794
Oct'87-Sep'88	1,314,164	1,357,068	1,295,982	1,277,954
Oct'88-Sep'89	1,413,677	1,456,381	1,370,619	1,344,256
Three Year Total	3,963,608	4,110,400	3,847,869	3,789,004
Southern Hemisphere				
Oct'86-Sep'87	149,976	147,346	154,889	158,181
Oct'87-Sep'88	172,804	171,550	175,768	185,430
Oct'88-Sep'89	196,049	191,248	196,319	211,265
Three Year Total	518,829	510,144	526,976	554,876
Worldwide				
Oct'86-Sep'87	1,385,743	1,444,297	1,336,157	1,324,975
Oct'87-Sep'88	1,486,968	1,528,618	1,471,750	1,463,384
Oct'88-Sep'89	1,609,726	1,647,629	1,566,938	1,555,521
Three Year Total	4,482,437	4,620,544	4,374,845	4,343,880

TABLE 2.3 OAG AIRPORT OPERATIONS BY MONTH
(OCTOBER 1986 THROUGH SEPTEMBER 1989)

ALL AIRPORTS WITH SCHEDULED B737 OPERATIONS

MONTH	OAG DESTINATION-ARRIVAL CODES**					(Total)
	(0)	(1)	(2)	(3)	(4)	
OCT	641,872	776,446	11,516	212	8,986	1,439,032
NOV	630,484	750,104	11,174	146	9,064	1,400,972
DEC	653,862	786,540	12,090	108	10,228	1,462,828
JAN	661,904	791,504	12,556	174	9,682	1,475,820
FEB	607,282	733,084	11,566	174	8,394	1,360,500
MAR	669,266	805,420	12,456	180	8,934	1,496,256
APR	661,436	783,124	11,738	212	8,130	1,464,640
MAY	693,966	814,452	12,124	264	8,882	1,529,688
JUN	685,538	803,792	13,042	182	9,100	1,511,654
JUL	708,036	831,962	13,700	290	10,008	1,563,996
AUG	720,400	845,508	13,336	350	10,032	1,589,626
SEP	700,354	804,790	12,440	364	8,746	1,483,634
TOTAL	8,034,400	9,526,726	147,738	2,656	110,186	17,821,706

AIRPORTS EXPERIENCING BIRD INGESTIONS DURING REPORTING PERIOD

MONTH	OAG DESTINATION-ARRIVAL CODES**					(Total)
	(0)	(1)	(2)	(3)	(4)	
OCT	409,604	602,384	8,376	212	5,729	1,026,305
NOV	406,442	583,757	7,811	146	5,691	1,003,847
DEC	421,210	611,970	8,349	108	6,348	1,047,985
JAN	426,326	616,496	8,668	174	6,079	1,057,743
FEB	392,519	572,802	7,958	174	5,315	978,768
MAR	432,869	629,646	8,483	180	5,790	1,076,968
APR	427,835	611,822	8,084	212	5,359	1,053,312
MAY	450,877	638,458	8,484	264	5,860	1,103,943
JUN	447,965	629,500	9,118	182	5,997	1,092,762
JUL	459,566	649,333	9,370	290	6,550	1,125,109
AUG	466,043	660,417	9,063	350	6,528	1,142,401
SEP	453,994	627,456	8,646	364	5,842	1,096,302
TOTAL	5,195,250	7,434,041	102,410	2,656	71,088	12,805,445

- ** =0 Any Carrier. Operation begins and ends out of the US.
 =1 Domestic Carrier. Operation begins and ends in the US.
 =2 Domestic Carrier. Departure or arrival, but not both, in the US.
 =3 Foreign Carrier. Operation begins and ends in the US.
 =4 Foreign Carrier. Departure or arrival, but not both, in the US.

TABLE 2.4 SCHEDULED AIRCRAFT OPERATIONS BY ENGINE TYPE

<u>GEOGRAPHIC LOCATION</u>	<u>JT8D</u>	<u>CFM56</u>	<u>ALL ENGINES</u>
United States			
Oct'86 - Sep'87	1,160,091	353,656	1,513,747
Oct'87 - Sep'88	1,082,543	527,431	1,609,974
Oct'88 - Sep'89	1,007,797	697,654	1,705,451
	-----	-----	-----
Three Year Total	3,250,431	1,578,741	4,829,172
Foreign			
Oct'86 - Sep'87	1,057,633	174,206	1,231,839
Oct'87 - Sep'88	1,062,971	302,415	1,365,386
Oct'88 - Sep'89	1,025,228	459,228	1,484,456
	-----	-----	-----
Three Year Total	3,145,832	935,849	4,081,681
Worldwide			
Oct'86 - Sep'87	2,217,724	527,862	2,745,586
Oct'87 - Sep'88	2,145,514	829,846	2,975,360
Oct'88 - Sep'89	2,033,025	1,156,882	3,189,907
	-----	-----	-----
Three Year Total	6,396,263	2,514,590	8,910,853

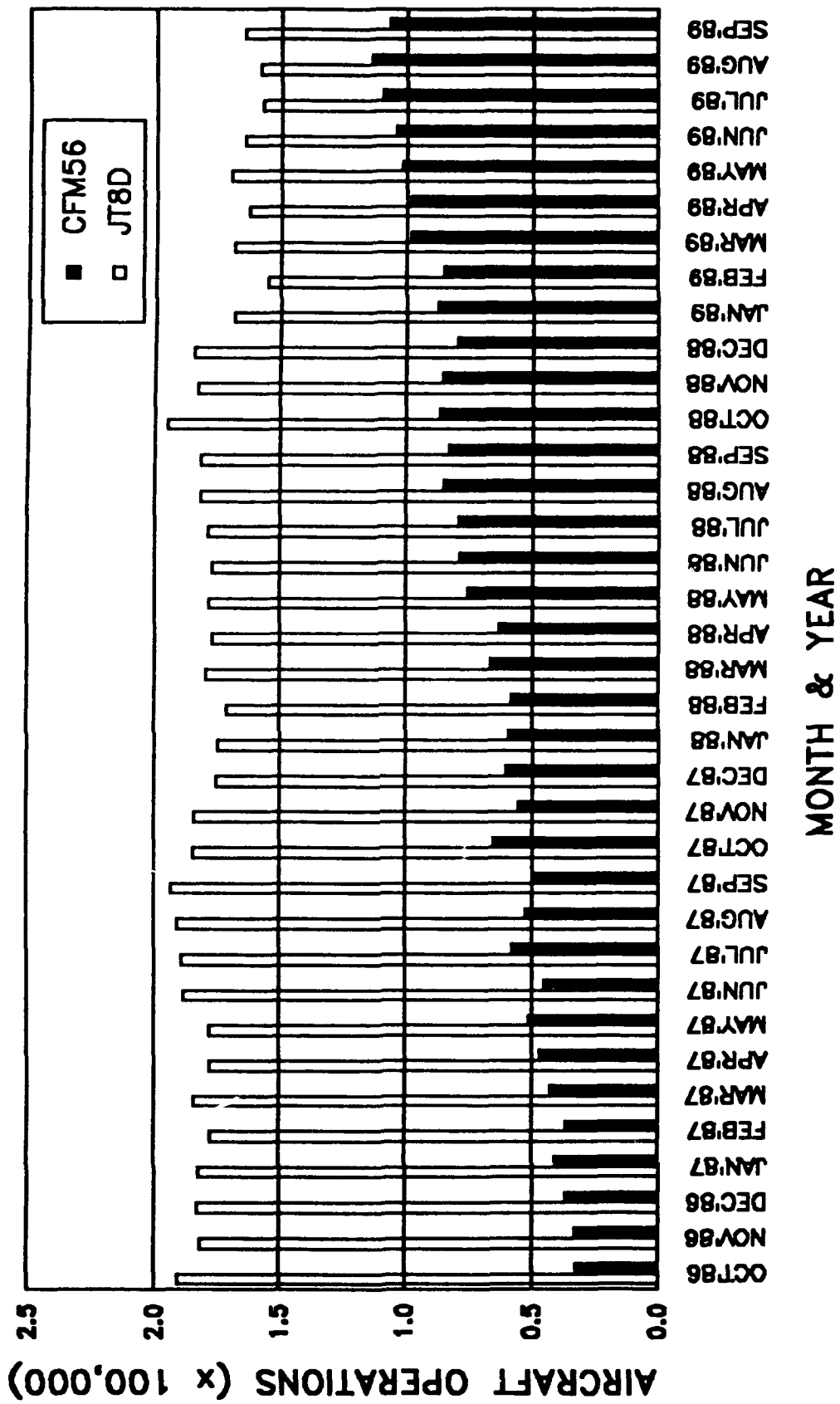


Figure 2.1. Histogram of Monthly Aircraft Operations by Engine Type.

SECTION 3 CHARACTERISTICS OF INGESTED BIRDS

This section provides a description of the birds that were ingested during the data collection period and an analysis of the extent of the bird ingestion threat. The bird related features that are described in this section include species, weight, seasonal trends, time of day trends, and geographic location.

A detailed breakdown of aircraft ingestion events in the United States is presented in Figures 3.1 and 3.2. Figure 3.1 is a contour map of the contiguous United States with the height of the contours being proportional to the number of aircraft ingestion events in each state while Figure 3.2 is a bar chart with the same information plus Alaska and Hawaii. Texas and California have the greatest number of ingestions followed by Hawaii, Florida, Illinois, and New York.

Table 3.1 provides a tally of all the species that were positively identified by an ornithologist during the collection period. The counts in the US, Foreign, and Overall columns of Table 3.1 indicate the number of aircraft ingestion events in which each bird species was ingested. The species are listed by order and family and it is apparent that the gulls, doves and lapwing/plover families of the order charadriiformes (shorebirds) are the most commonly ingested birds worldwide. The order columbiformes (doves/pigeons) appear to be a bird ingestion problem for the United States while the order falconiformes (hawks/vultures) poses a significant threat abroad.

One of the disappointing features of the B737 bird ingestion data base is the low bird identification rate. The bird species was positively identified in only 237 out of 1,410 aircraft ingestion events that were recorded giving a 16.8 percent identification rate. The identification rate for engine ingestion events in which an engine sustained damage (23.4 percent) was almost 74 percent greater than the identification rate for events which caused no engine damage (13.3 percent); which could indicate that the group of identified birds is biased to include more birds in the size and weight ranges that tend to damage engines when ingested. Any conclusions about the population of ingested birds should be viewed with the caution that the sample might be more representative of the population of birds that damage engines than of all birds that are ingested.

The species-related descriptions of ingested birds in this report probably provide a conservative view in that the birds that caused damage are better represented in the sample than birds that did not cause damage. The bird features that influence damage cannot be discerned, however, because of the possible bias in the identifications. That is, the differences between the birds that cause damage and the birds that don't cause damage cannot be readily identified since there is less information about the birds that didn't cause damage.

Table 3.2 is a frequency table of weights for the positively identified birds. The bird weights are derived from the species identification and when possible are adjusted for the age and sex of the ingested bird. The modes in

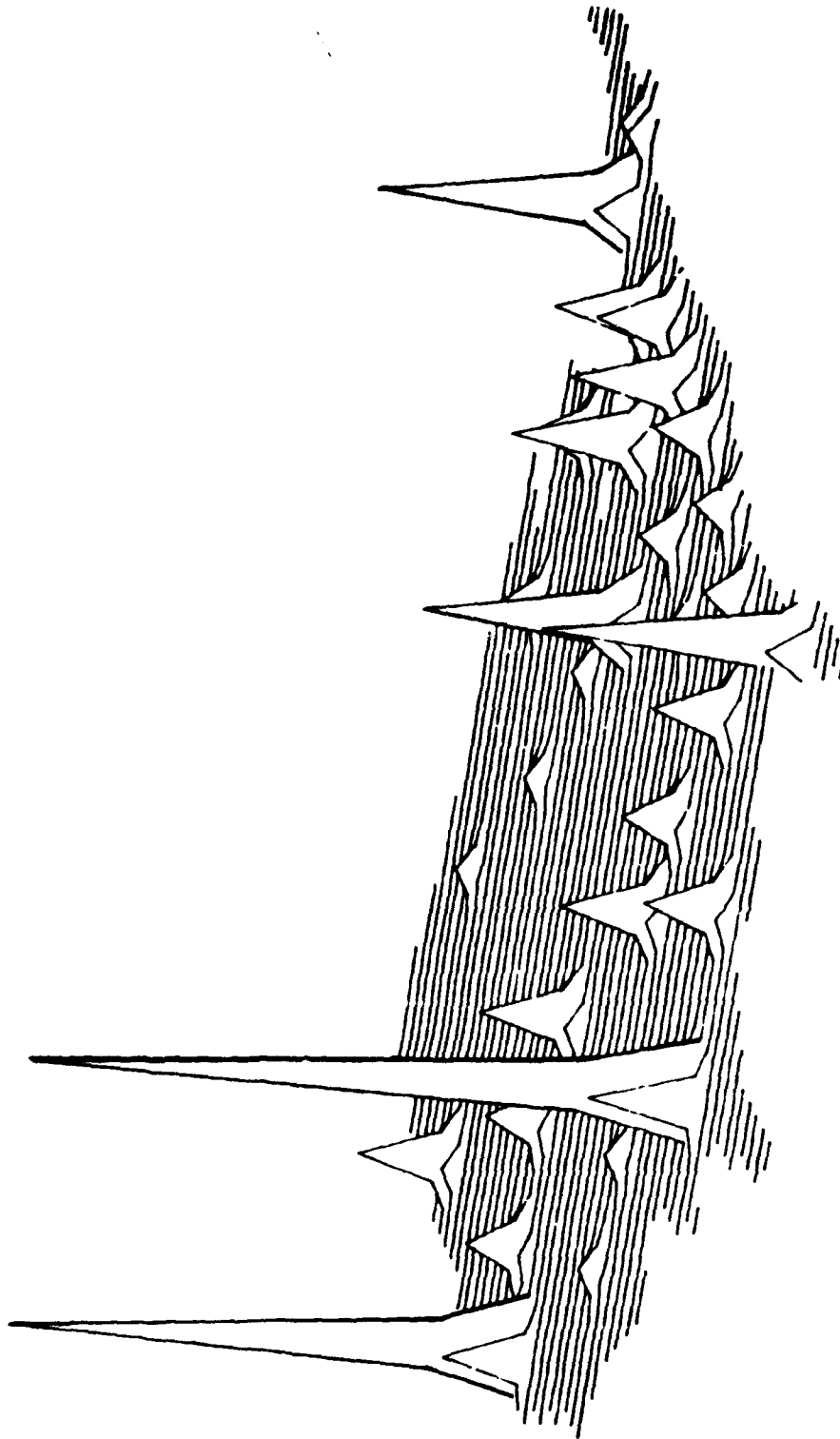


Figure 3.1 Contour Map of Domestic Aircraft Ingestion Events

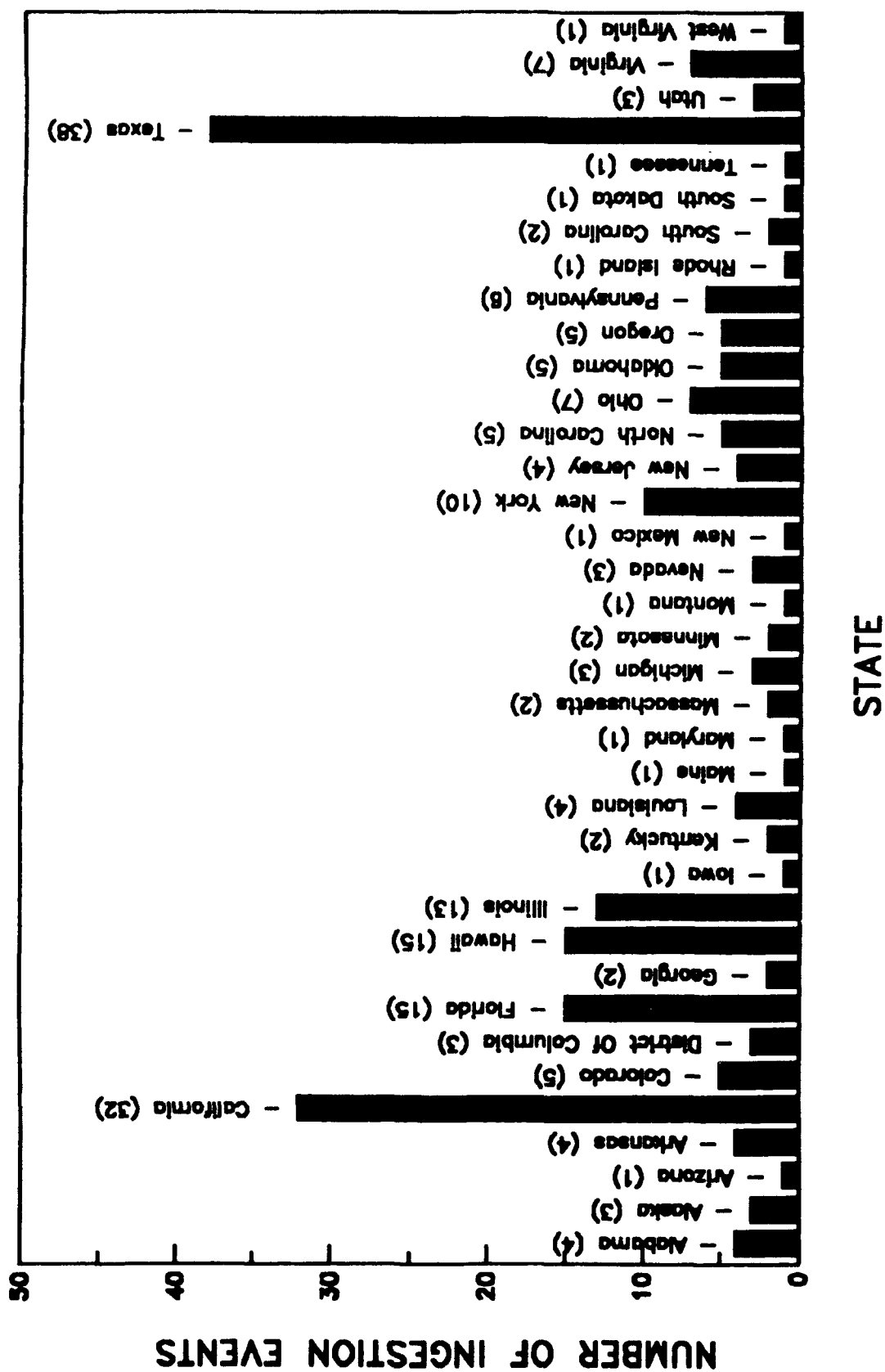


Figure 3.2. Histogram of Bird Ingestion Events by State.

TABLE 3.1 TALLY OF POSITIVELY IDENTIFIED BIRD SPECIES
BROKEN DOWN BY US FOREIGN AND OVERALL
(AIRCRAFT INGESTION EVENTS)

Latin Name	Common Name	Species Code	US	Foreign	Overall
Nycticorax nycticorax	Black-crowned night heron	1I24	1		1
Bubulcus ibis	Cattle egret	1I35	1	0	1
Egretta alba	Great egret	1I52	2	0	2
Hagedashia hagedash	Hadada ibis	6I12	0	3	3
Chen caerulescens	Snow goose	2J26	0	2	2
Branta canadensis	Canada goose	2J30	1	0	1
Anas americana	American wigeon	2J71	1	0	1
Anas platyrhynchos	Mallard	2J84	2	0	2
Coragyps atratus	Black vulture	1K4	0	1	1
Pandion haliaetus	Osprey	2K1	1	0	1
Milvus migrans	Black kite	3K28	0	8	8
Gyps bengalensis	Indian white-backed vulture	3K46	0	2	2
Aegypius monachus	Eurasian black vulture	3K55	0	1	1
Circus cyaneus	Northern marsh harrier	3K78	1	0	1
Accipiter nisus	European sparrowhawk	3K103	0	2	2
Accipiter striatus	Sharp-shinned hawk	3K105	1	0	1
Geraonaeetus melanoleucus	Gray eagle-buzzard	3K161	1	1	2
Buteo swainsonii	Swainson's hawk	3K171	1	1	2
Buteo buteo	Common buzzard	3K180	0	2	2
Falco sparverius	American kestrel	5K26	2	0	2
Falco tinnunculus	Eurasian kestrel	5K27	0	10	10
Falco berigora	Brown falcon	5K39	0	1	1
Alectoris rufa	Red-legged partridge	4L41	0	1	1
Alectoris barbara	Barbary partridge	4L42	0	1	1
Francolinus francolinus	Black francolin	4L44	0	1	1
Perdix perdix	Hungarian partridge	4L85	0	3	3
Phasianus colchicus	Ring-necked pheasant	4L161	1	0	1
Porsana carolina	Sora	7M84	1	0	1
Haematopus ostralegus	Common oystercatcher	4N1	0	1	1
Vanellus vanellus	Common lapwing	5N1	0	10	10
Vanellus spinosus	Spur-winged plover	5N4	0	2	2
Vanellus melanopterus	Black-winged plover	5N10	0	1	1
Vanellus coronatus	Crowned lapwing	5N11	0	2	2
Vanellus vanellus	Gray-headed lapwing	5N20	0	2	2
Vanellus miles	Masked plover	5N24	0	2	2
Pluvialis apricaria	Eurasian golden plover	5N25	2	1	3
Charadrius dubius	Little ringed plover	5N31	2	1	3
Charadrius vociferus	Killdeer	5N33	2	1	3
Numenius americanus	Long-billed curlew	6N12	1	1	2
Bartramia longicauda	Upland sandpiper	6N13	1	0	1
Gallinago gallinago	Common snipe	6N47	0	2	2
Burhinus oedipnemus	Eurasian stone-curlew	9N1	0	1	1
Burhinus capensis	Cape dikkop	9N4	0	2	2
Stiltia isabellia	Australian courser	10N9	0	1	1
Stercorarius pomarinus	Pomarine jaeger	13N4	1	0	1
Larus delawarensis	Ring-billed gull	14N12	3	0	3
Larus canus	Common gull	14N13	10	3	13
Larus argentatus	Herring gull	14N14	7	1	18

TABLE 3.1 (CONCLUDED) TALLY OF POSITIVELY IDENTIFIED BIRD SPECIES
BROKEN DOWN BY US, FOREIGN, AND OVERALL
(AIRCRAFT INGESTION EVENTS)

Latin Name	Common Name	Species Code	US	Foreign	Overall
Larus fuscus	Lesser black-backed gull	14N17	0	1	1
Larus marinus	Great black-backed gull	14N21	0	1	1
Larus glaucescens	Glaucous-winged gull	14N22	0	1	1
Larus cirrocephalus	Gray-headed gull	14N29	1	2	3
Larus novaehollandiae	Silver gull	14N32	0	1	1
Larus maculipennis	Brown-hooded gull	14N35	0	3	3
Larus ridibundus	Common black-headed gull	14N36	1	16	17
Larus philadelphia	Bonaparte's gull	14N38	0	1	1
Columba livia	Common rock dove	2P1	8	3	11
Columba guinea	African speckled pigeon	2P4	0	1	1
Pterocles gutturalis	Common wood-pigeon	2P9	0	4	4
Streptopelia turtur	Common turtle dove	2P50	0	1	1
Streptopelia chinensis	Spotted dove	2P65	0	1	1
Geopelia striata	Zebra dove	2P102	1	1	2
Geopelia humeralis	Bar-shouldered dove	2P103	1	1	2
Zenaidura macroura	American mourning dove	2P105	1	1	2
Zenaidura macroura	Eared Dove	2P106	6	1	7
Cuculus roseicapilla	Galah	1Q15	0	1	1
Cuculus canorus	Common cuckoo	2R15	0	3	3
Coccyzus americanus	Yellow-billed cuckoo	2R51	0	3	3
Tyto alba	Common barn owl	1S2	1	0	1
Athene noctua	Common little owl	2S100	0	3	3
Speotyto cunicularia	Burrowing owl	2S102	0	1	1
Asio flammeus	Short-eared owl	2S124	0	1	1
Chordeiles minor	Nighthawk	5T5	1	0	1
Chaetura pelagica	Chimney swift	1U33	1	0	1
Apus apus	Common swift	1U55	1	0	1
Aeronautes saxatalis	White-throated swift	1U71	1	0	1
Alauda arvensis	Common skylark	17Z72	1	0	1
Eremophila alpestris	Horned lark	17Z74	4	0	4
Progne subis	Purple martin	18Z12	1	0	1
Delichon urbica	Common house martin	18Z69	4	0	4
Sturnus vulgaris	Common starling	21Z75	1	4	5
Corvus brachyrhynchos	Common crow	22Z85	1	1	2
Corvus corone	Carrion crow	22Z94	0	1	1
Gymnorhina tibicen	Australian bell magpie	23Z7	0	1	1
Catharus ustulatus	Swainson's thrush	41Z2246	1	0	1
Turdus merula	Common blackbird	41Z2269	1	1	2
Turdus iliacus	Red-winged blackbird	41Z2281	0	1	1
Turdus philomelos	Common song thrush	41Z2282	0	1	1
Turdus migratorius	American robin	41Z314	0	1	1
Icteria virens	Yellow-breasted chat	63Z69	1	0	1
Sturnella neglecta	Western meadowlark	64Z68	2	1	3
Zonotrichia albicollis	White-throated sparrow	68Z218	1	0	1
Passer domesticus	House sparrow	70Z12	0	1	1
			83	154	237

TABLE 3.2 WEIGHT DISTRIBUTION OF INGESTED BIRDS* BY ORIGIN

Weight Range (Oz)	United States			Foreign			Worldwide		
	Multiple Bird Events	Single Bird Events	Total Bird Events	Multiple Bird Events	Single Bird Events	Total Bird Events	Multiple Bird Events	Single Bird Events	Total Bird Events
(0 < x <= 4)	3	30	33	8	17	25	11	47	58
(4 < x <= 8)	0	7	7	13	29	42	13	36	49
(8 < x <= 12)	0	1	1	8	29	37	8	30	38
(12 < x <= 16)	6	19	25	4	13	17	10	32	42
(16 < x <= 20)	1	1	2	2	5	7	3	6	9
(20 < x <= 24)	0	2	2	1	1	2	1	3	4
(24 < x <= 28)	0	2	2	0	5	5	0	7	7
(28 < x <= 32)	0	0	0	0	6	6	0	6	6
(32 < x <= 36)	0	2	2	1	1	2	1	3	4
(36 < x <= 40)	2	8	10	5	6	11	7	14	21
(40 < x <= 44)	0	1	1	0	0	0	0	1	1
(44 < x <= 48)	0	0	0	0	4	4	0	4	4
(52 < x <= 56)	0	2	2	1	0	1	1	2	3
(56 < x <= 60)	0	0	0	0	1	1	0	1	1
(76 < x <= 80)	0	0	0	0	1	1	0	1	1
(84 < x <= 88)	0	0	0	0	2	2	0	2	2
(124 < x <= 128)	1	0	1	0	0	0	1	0	1
(188 < x <= 192)	0	0	0	0	2	2	0	2	2
TOTAL	13	75	88	43	122	165	56	197	253

* Counted by Engine Ingestion Events

Table 3.2 therefore represent the weights of the more commonly identified bird species that were ingested. Figure 3.3 provides the same information in the form of a histogram. Most of the ingested birds (77.5 percent) that were identified in this study weighed less than or equal to 20 ounces; however, 6.7 percent weighed more than 20 ounces and less than or equal to 32 ounces and 15.8 percent of the identified birds weighed more than 2 pounds.

Summary statistics calculated from the raw data for the United States, foreign and worldwide bird weight distributions are presented in Table 3.3. Note that the weight of one ingested bird per event is included in the bird weight distribution for multiple bird engine ingestion events. The mean, median and mode are three different concepts for the typical or average value which measures the central tendency of the distribution. The mean bird weight is the sum of the bird weights for all ingestion events divided by the number of events included in the sum. The median weight divides the weights into two groups with half the weights below the median and half above. The mode of the bird weights is the weight that has the highest frequency in the data set. The median and mode are more relevant measures of the average for the bird ingestion problem. The mean weight would be important if damage were related to the cumulative weight of all birds ingested by a single engine since the mean is based on the total weight of the ingested birds.

A pattern suggestive of a sine function is seen in Figure 3.4 which is a bar chart of monthly bird ingestions for the data collection period. The cyclic pattern in aircraft ingestion events reflects seasonal bird activity. The start of a cyclic pattern is also seen in the ingestion rate data which indicates that the trends are due to the changing bird population and not changes in air traffic activity. Time trends in bird ingestions are further investigated on a seasonal basis in the following paragraphs.

The seasonal bird ingestion rates for the Northern and Southern Hemispheres, the United States and foreign countries and the whole world are presented in the bar chart of Figure 3.5. Here the ingestion rates are not being compared by engine type so the ingestion rate R is simply calculated as:

$$R = \text{Ing} \cdot \frac{10000}{\text{Ops}} \quad (3.1)$$

where Ing is the number of ingestions and Ops is the number of aircraft operations in the time period being considered. The rate is expressed as ingestions per 10,000 aircraft operations.

Seasonal trends were investigated using a Chi-squared goodness-of-fit (GOF) analysis. The Chi-squared value for testing the hypothesis that the number of aircraft ingestion events does not vary with the seasons is 170.3. The critical value for testing at the five percent level of significance is 7.81 while the 0.5 percent level is 12.8; therefore, the high value of the test statistic is a very strong indication that ingestions do vary with the seasons.

The winter data were eliminated in an effort to better identify the nature of the differences between the seasons. Testing for the equality of the ingestions for spring, summer and autumn also yields a significant difference with a test statistic of 82.19 and a five percent critical value of

5.99 which is also a very strong indication that ingestions vary between spring, summer, and autumn. Further testing between summer and autumn produces a test statistic of 23.9 which is also much larger than the five percent critical value of 3.84 for comparing two groups. Seasonal ingestion rates rank highest to lowest with summer, autumn, spring, and winter.

The time of day distribution of bird ingestion events is illustrated in Figure 3.6 with time of day reduced to the four basic segments of morning, mid-day, evening and night. There is a noticeable drop in the number of ingestions at night and the Chi-squared test for equality of the four time periods indicates that they are not the same. The Chi-squared test statistic is 104.9 while the 99th percentile of the Chi-squared with three degrees of freedom distribution is 11.34.

There are two likely reasons for a drop in ingestions during the night. Birds are not generally nocturnal so that bird activity is reduced at night. Also, there are fewer flights scheduled at night. A lessened exposure due to fewer flights and fewer birds results in a reduction in the number of ingestions at night.

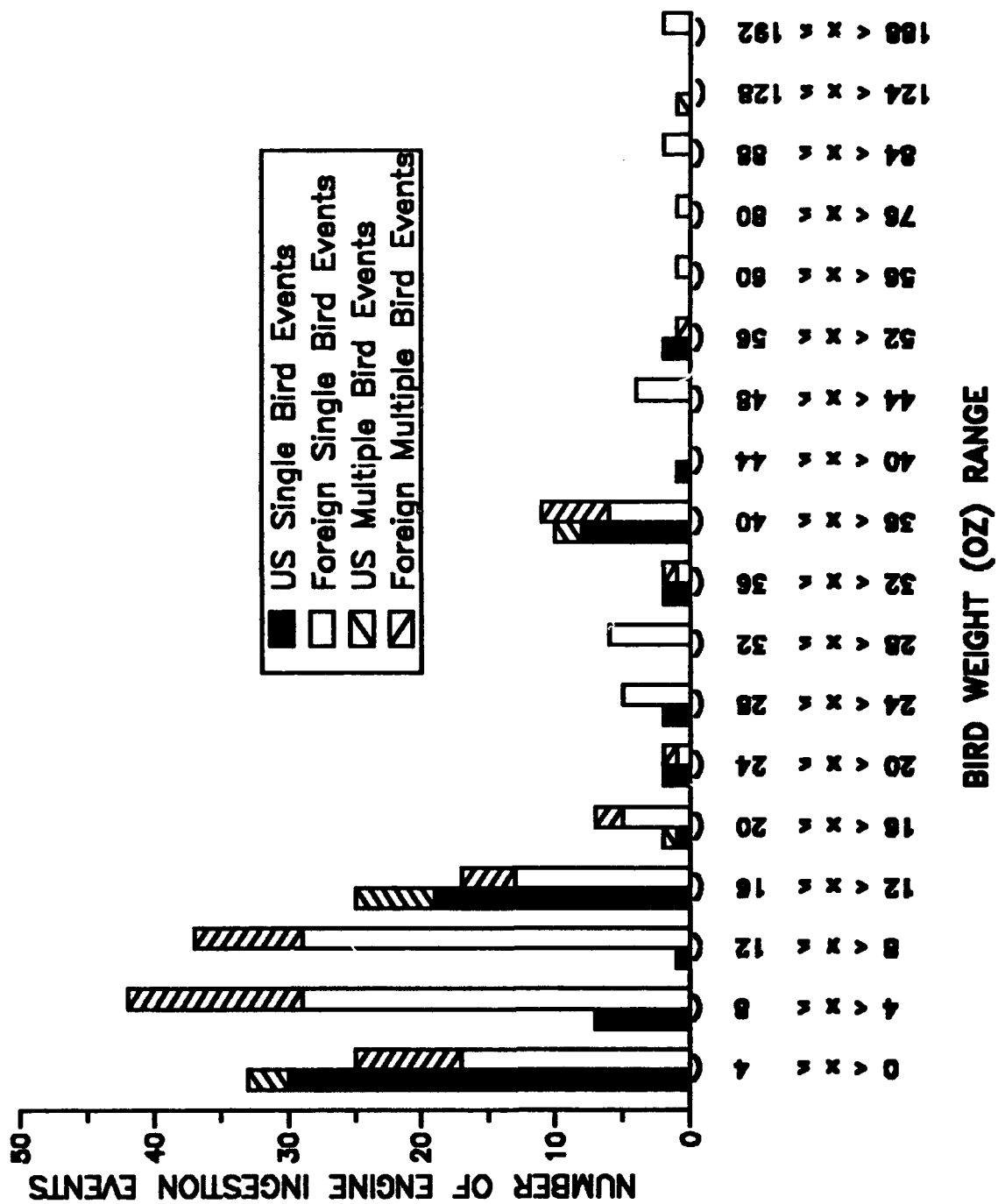


Figure 3.3. Histogram of Number of Birds Ingested by Weight Class.

TABLE 3.3 SUMMARY STATISTICS FOR INGESTED BIRD WEIGHTS

* STATISTIC	United States				Foreign				Worldwide			
	Multiple Bird Events	Single Bird Events	Total Bird Events	Total	Multiple Bird Events	Single Bird Events	Total Bird Events	Total	Multiple Bird Events	Single Bird Events	Total Bird Events	Total
NUMBER OF EVENTS**	13	75	88		43	122	165		56	187	253	
MODE(S)	14. 15.	4.	15.		7. 40.	10.	10. 40.		40.	40.	40.	
MEDIAN	14.	6.0	14.		8.0	10.0	10.0		10.1	10.0	10.	
MEAN (AVERAGE)	24.5	14.4	15.9		13.9	19.2	17.8		16.9	17.4	17.2	
STD DEVIATION	33.15	14.54	18.56		13.49	27.79	24.94		20.39	23.71	22.90	

*
Bird Weights Given in Ounces

**
Counted by Engine Ingestion Events

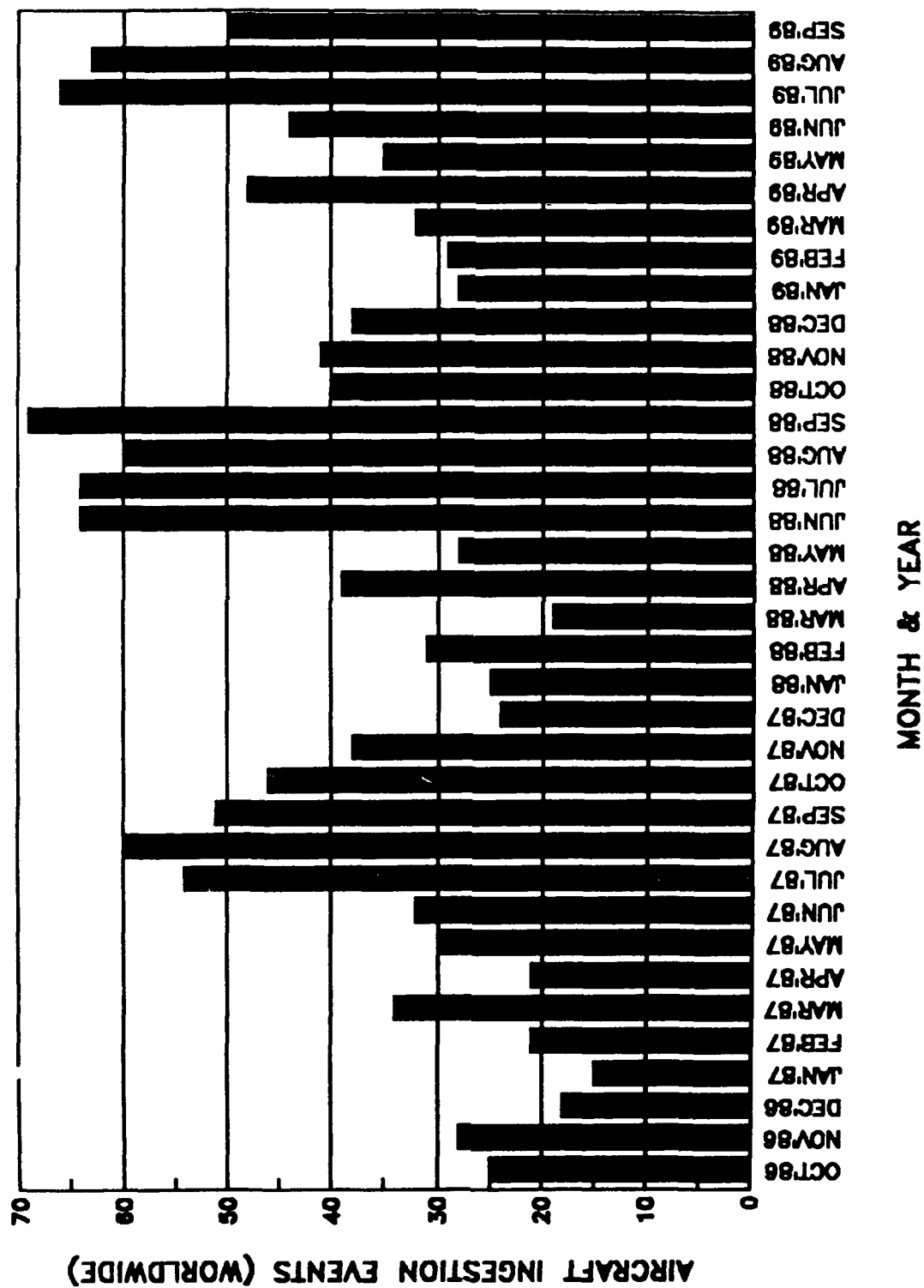


Figure 3.4. Histogram of Monthly Worldwide Aircraft Ingestion Events.

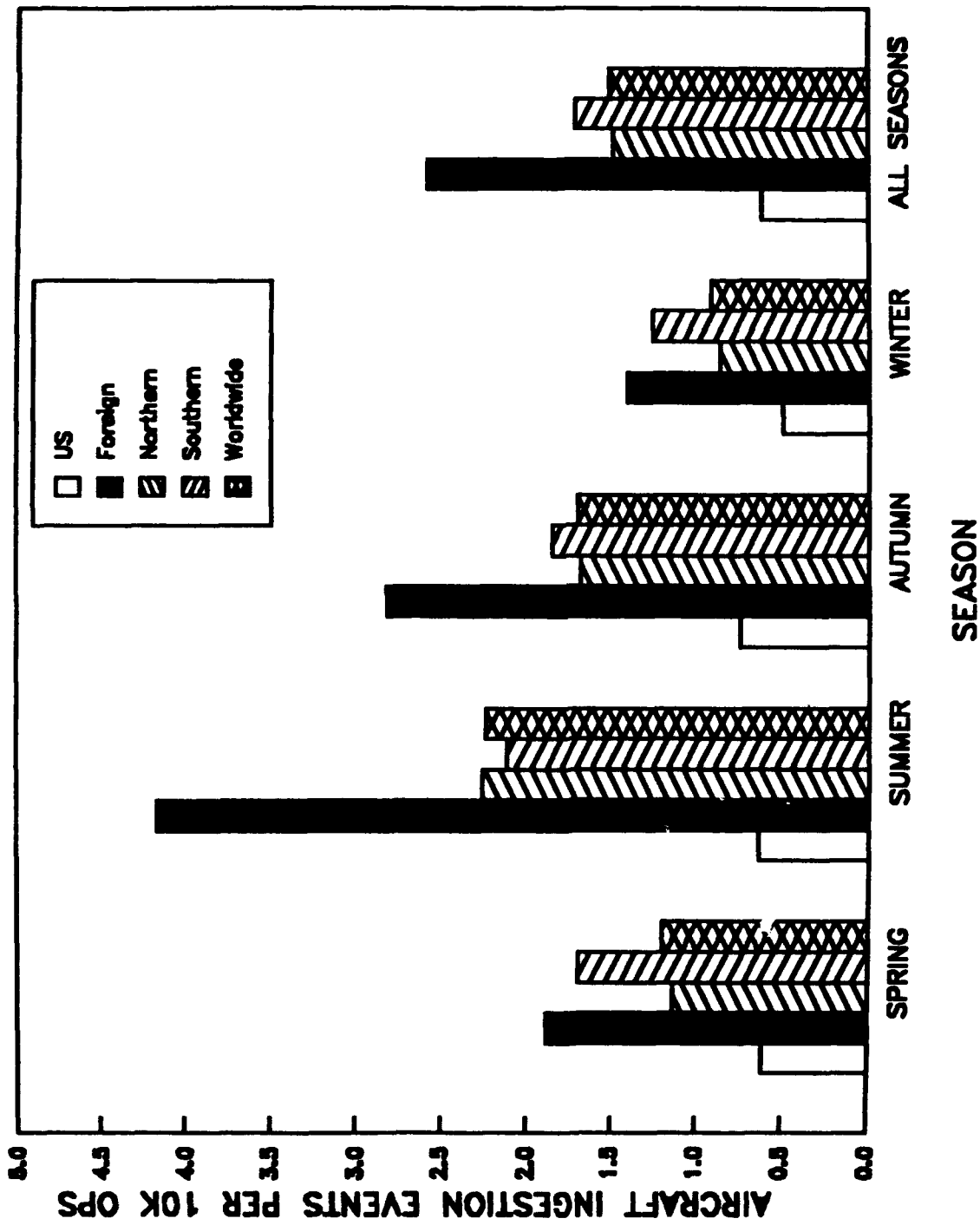


Figure 3.5. Histogram of Seasonal Aircraft Ingestion Rates.

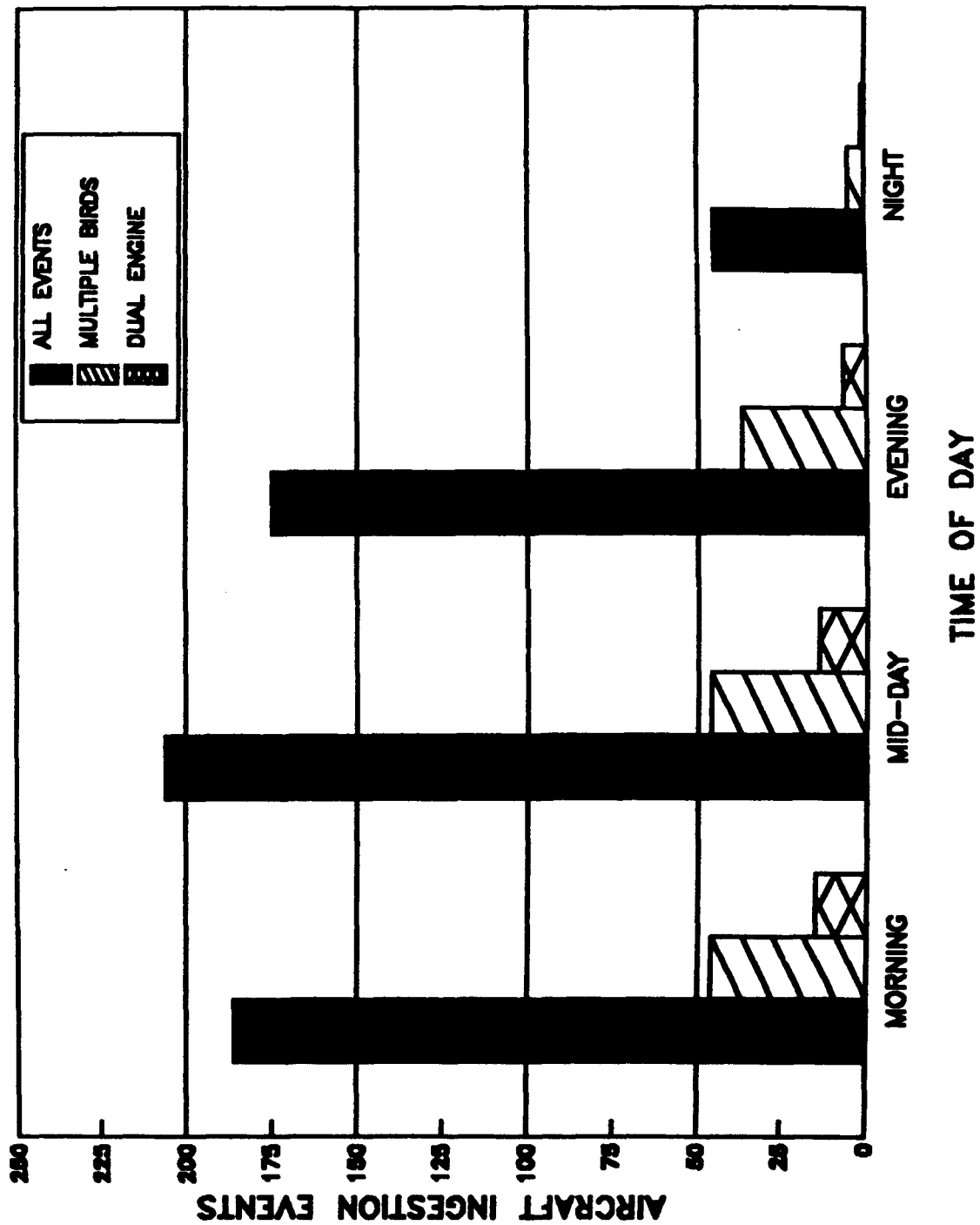


Figure 3.6. Histogram of Aircraft Ingestion Events by Time of Day.

SECTION 4 INGESTION RATES

This section describes the rates at which bird ingestions occurred during the 3-year collection period covered in this report. The Poisson distribution is commonly used to describe how events are randomly scattered in time and the bird ingestion data are shown to agree with the assumptions of a Poisson process. The first part of this section provides the estimates of the basic ingestion rates. The second part describes the Poisson distribution and how it relates to the bird ingestion events. The final parts discuss statistical analyses based on the assumption that bird ingestions follow a Poisson process.

4.1 INGESTION RATE ESTIMATES.

This sub-section provides a general description of ingestion rates broken down by location, engine and phase of flight. The rates are given in terms of ingestions per 10,000 aircraft operations and have been adjusted to the inlet area of the engine to allow size independent comparisons between engines. The inlet area used throughout this report is called the "fat lip area" and was specified by the Boeing Company for each type of engine installation. A more detailed statistical analysis of ingestion rates is covered in the next section using statistical techniques for Poisson processes.

Table 4.1A lists the United States, foreign and worldwide ingestion rates for both the JT8D and the CFM56 engines as well as a composite rate for all 737 aircraft. The inlet area adjustment was done using a 10-square-foot unit area on the basis of the total inlet area of both engines to keep the rates in a reasonable range. The composite rates in each geographical region are weighted means of the inlet area adjusted rates for the individual engines and are determined as follows: the number of ingestions per 10 square feet inlet area for each engine is projected by multiplying the rates by the number of aircraft operations. The composite rates are calculated by dividing the total projected ingestions for both engines by the total aircraft operations for the geographical region. Table 4.1B lists engine ingestion rates based on engine operations and normalized for the engine inlet area. The numbers in parentheses in Tables 4.1A and 4.1B reflect the number of ingestions where geographic location and/or engine type was not known.

The ingestion rates for the CFM56 engine were calculated using reported aircraft operations for specific geographical regions. The ingestion rates for the JT8D engine were calculated using estimated aircraft operations for specific geographical regions. The details of the calculation were presented in Section 3, equation 3.1.

Figure 4.1 shows monthly ingestion rates subdivided by engine type and adjusted for inlet area so that a comparison between engine types can be made. The adjusted monthly ingestion rate (R_{adj}) for an engine type is expressed as ingestions per 10 ft² per 10,000 aircraft operations is calculated as:

$$R_{adj} = \text{Ing} \cdot \frac{1440}{2 \text{ IA}} \cdot \frac{10000}{\text{Ops}} \quad (4.1)$$

TABLE 4.1A
BREAKDOWN OF BIRD INGESTION RATES BY ENGINE AND LOCATION
(BASED ON AIRCRAFT OPERATIONS)

ENGINE TYPE:	JT8D	CFM56	ALL ENGINES
INLET AREA: *	2234 in ²	4606 in ²	N/A
<u>UNITED STATES</u>			
Aircraft Ingestion Events	136	151	304 (17)
OAG Aircraft Operations	3,250,431	1,578,741	4,829,172
Ingestion Rate (Ing/10K Ops)	0.42	0.96	0.63
Normalized Ingestion Rate (Ing/10K Ops/10ft ²)	0.27	0.30	0.28
<u>FOREIGN</u>			
Aircraft Ingestion Events	784	293	1,104 (27)
OAG Aircraft Operations	3,145,832	935,849	4,081,681
Ingestion Rate (Ing/10K Ops)	2.49	3.13	2.70
Normalized Ingestion Rate (Ing/10K Ops/10ft ²)	1.61	0.98	1.46
<u>WORLDWIDE</u>			
Aircraft Ingestion Events	921 (1)	445 (1)	1,410 (46)
OAG Aircraft Operations	6,396,263	2,514,590	8,910,853
Ingestion Rate (Ing/10K Ops)	1.44	1.77	1.58
Normalized Ingestion Rate (Ing/10K Ops/10ft ²)	0.93	0.55	0.82

*Total Area for 2 Engines

TABLE 4.1B
BREAKDOWN OF BIRD INGESTION RATES BY ENGINE AND LOCATION
(BASED ON ENGINE OPERATIONS)

ENGINE TYPE:	JT8D	CFM56	ALL ENGINES
INLET AREA:	1117 in ²	2303 in ²	N/A
<u>UNITED STATES</u>			
Engine Ingestion Events	142	157	317 (18)
OAG Engine Operations	6,500,862	3,157,482	9,658,344
Ingestion Rate (Ing/10K Ops)	0.22	0.50	0.33
Normalized Ingestion Rate (Ing/10K Ops/10ft ²)	0.28	0.31	0.29
<u>FOREIGN</u>			
Engine Ingestion Events	811	310	1,149 (28)
OAG Engine Operations	6,291,664	1,871,698	8,163,362
Ingestion Rate (Ing/10K Ops)	1.29	1.66	1.41
Normalized Ingestion Rate (Ing/10K Ops/10ft ²)	1.66	1.04	1.52
<u>WORLDWIDE</u>			
Engine Ingestion Events	954 (1)	468 (1)	1,468 (48)
OAG Engine Operations	12,792,526	5,029,180	17,821,706
Ingestion Rate (Ing/10K Ops)	0.75	0.93	0.82
Normalized Ingestion Rate (Ing/10K Ops/10ft ²)	0.96	0.58	0.85

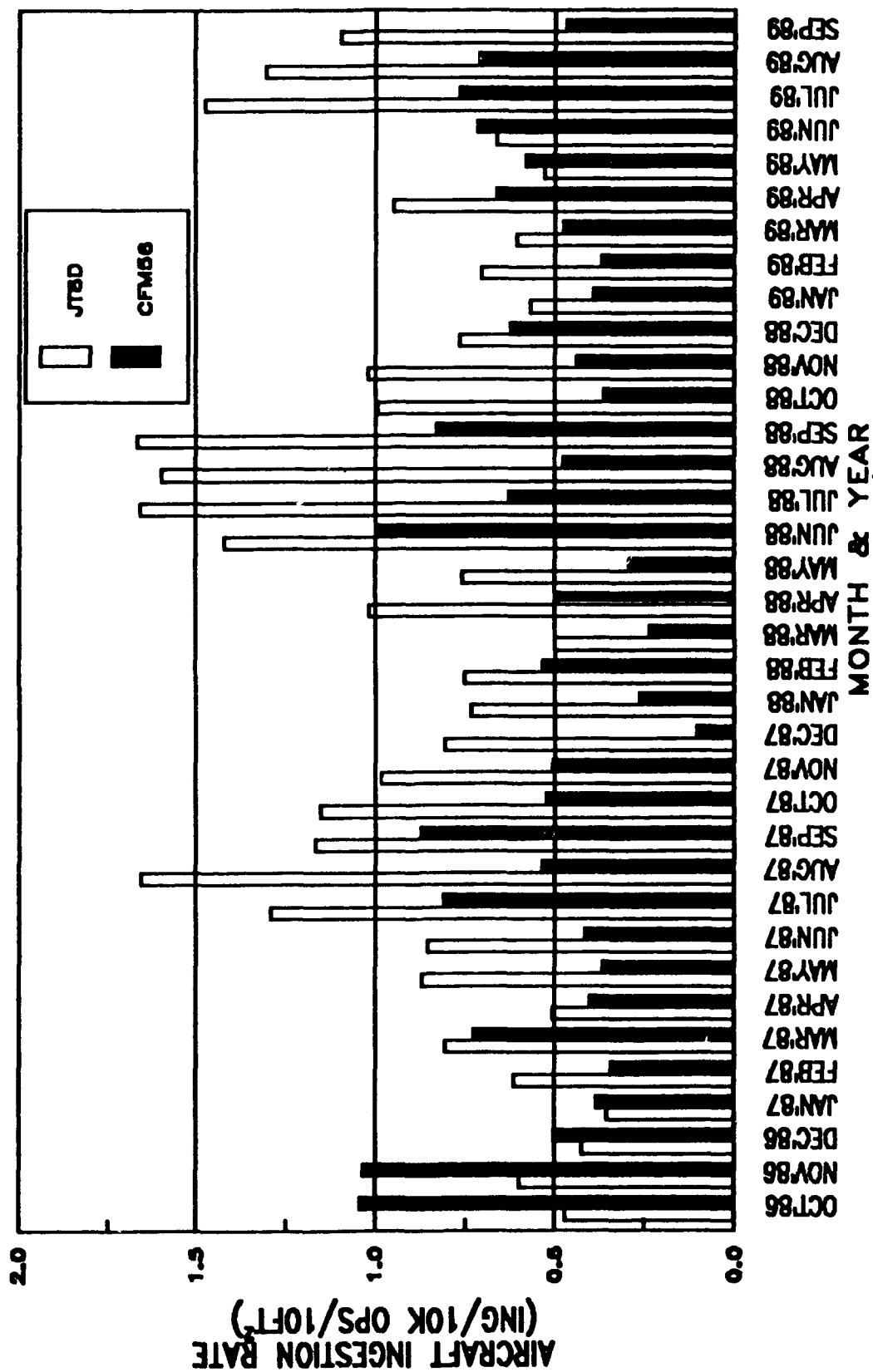


Figure 4.1. Histogram of Monthly Aircraft Ingestion Rates by Engine Type (Normalized for Inlet Area).

where Ing is the number of monthly aircraft ingestion events for an engine type, IA is the inlet area (in²) of the engine type, and Ops is the number of aircraft operations for the month. Twice the engine area is used because there are two engines on each B737 aircraft. The constant 1440 is the factor for converting square inches to units of 10-square-foot areas.

The phase of flight ingestion rate tabulation is presented in Table 4.2A. The method used to calculate ingestion rate 1 is expressed in Equation 3.1. The area adjustment used for ingestion rate 2 is implemented using Equation 4.1. The highest ingestion rates were in the takeoff and landing phases followed by the climb and approach phases. There were very few ingestions during the taxi and cruise phases of flight. This pattern is typically seen in bird strike and bird ingestion studies and is indicative of the fact that airports are often located in desirable bird environs. Since birds congregate around airports there is a greater chance of striking or ingesting a bird during the phases of flight that take place close to the airports. Also, commercial airline cruise routes are well above the altitude in which birds are usually found. Table 4.2B lists engine ingestion rates as a function of phase of flight. The differences in ingestion rates between Tables 4.2A and 4.2B are due to multiple engine ingestion events.

4.2 THE POISSON PROCESS.

The Poisson process is the simplest type of stochastic process which describes how events are distributed in time. The Poisson process is here taken to govern aircraft ingestion events and the times at which they occur are random. In a Poisson process the events are distributed somewhat evenly in time so that it appears that the times at which the events occurred form a uniform distribution. This section describes some of the properties of Poisson processes that will be useful in describing bird ingestions and in testing hypotheses about bird ingestion rates.

The basis of a Poisson process is a description of the probability distribution of the number of events that occur in a given time interval. The formula for the probability of n events in an interval of length T is:

$$P(X(T)=n) = \frac{e^{-\lambda T} (\lambda T)^n}{n!} \quad (4.2)$$

The parameter λ is the mean rate at which events occur and the mean number of events in the length T time interval is λT . The time scale that will be used in this study is number of aircraft operations. Ingestion rates are typically reported in events per 10,000 aircraft operations which implies the use of aircraft operations as the time scale in a Poisson process.

One derivation of the formula for the Poisson distribution is the limiting distribution of the binomial distribution for large sample size. If we assume that the probability of a bird ingestion is the same from flight to flight then the number of ingestions in a large number of flights has a binomial distribution. If the probability of ingestion is p and the number of flights is N then the probability that n ingestions occur in the N flights is:

$$P(X(N)=n) = \binom{N}{n} p^n (1-p)^{(N-n)} \quad (4.3)$$

TABLE 4.2A INGESTION RATES FOR ENGINE TYPE BY PHASE OF FLIGHT
(BASED ON AIRCRAFT INGESTION EVENTS)

	PRATT-WHITNEY JT8D		CFMI CFM56		ALL ENGINES*	
	INLET** AREA	2234 in ²	4606 in ²	---	---	---
AIRCRAFT OPERATIONS		6,396,263	2,514,590			8,910,853
PHASE OF FLIGHT	AIRCRAFT*** ING. INGEST† INGEST†† EVENTS RATE 1 RATE 2		AIRCRAFT*** ING. INGEST† INGEST†† EVENTS RATE 1 RATE 2		AIRCRAFT*** ING. INGEST† INGEST†† EVENTS RATE 1 RATE 2	
Parked	1	.002	.001	0	---	1 .001 .001
Taxi	6	.009	.006	4	.016	.005 .011 .006
Takeoff	540	.844	.544	189	.752	.235 .818 .457
Climb	60	.094	.060	54	.215	.067 .128 .062
Cruise	6	.009	.006	12	.048	.015 .020 .009
Approach	64	.100	.064	44	.175	.055 .121 .062
Landing	243	.380	.245	142	.565	.177 .432 .226
Other	1	.002	.001	0	---	1 .001 .001
All Phases	921	1.440	.928	445	1.770	.553 1.533 .822

* Includes Only Events Where Engine Type Known

** Total Area of 2 Engines

*** Contains Proportioned Apportionment of Events with Unknown Phase of Flight

† Ingestion Events Per 10,000 Operations

†† Ingestion Events Per 10,000 Operations Per 10 ft²

††† Function of JT8D Rate 2, CFM56 Rate 2, and Corresponding Operations

TABLE 4.2B INGESTION RATES FOR ENGINE TYPE BY PHASE OF FLIGHT
(BASED ON ENGINE INGESTION EVENTS)

PRATT-WHITNEY JT8D		CFMI CFM56		ALL ENGINES*	
INLET AREA	1117 in ²	2303 in ²	---		
ENGINE OPERATIONS	12,792,526	5,029,180	17,821,706		
PHASE OF FLIGHT	ENGINE**		ENGINE**		ENGINE** INGEST† EVENTS
	INGEST† EVENTS	INGEST† RATE 1	INGEST† EVENTS	INGEST† RATE 1	
		RATE 2		RATE 2	INGEST†† EVENTS
Parked	1	.001	0	---	1
Taxi	6	.005	4	.008	10
Takeoff	563	.440	198	.394	761
Climb	64	.050	54	.107	118
Cruise	6	.005	12	.024	18
Approach	65	.051	47	.093	112
Landing	248	.194	153	.304	401
Other	1	.001	0	---	1
All Phases	954	.746	468	.931	1422
				.582	.798
					.854

* Includes Only Events Where Engine Type Known

** Contains Proportioned Apportionment of Events with Unknown Phase of Flight

† Ingestion Events Per 10,000 Operations

†† Ingestion Events Per 10,000 Operations Per 10 ft²

††† Function of JT8D Rate 2, CFM56 Rate 2, and Corresponding Operations

The binomial probabilities in Equation 4.3 can be approximated by a Poisson distribution with mean Np for large values of N . That is, the single flight probability of an ingestion, p , replaces λ in Equation 4.2.

An important question that can be investigated through the Poisson process model of bird ingestions is the influence of inlet area on the ingestion rates. Past studies [7,8] in bird strikes have used the assumption that the probability of a bird strike is proportional to the cross sectional area of the aircraft. Applying the same concept to engines implies that the bird ingestion rate should be proportional to the inlet area of the engine.

The inlet area effect can be incorporated into the Poisson process model by letting the parameter λ represent the ingestion rate per unit area. The probability of n ingestions in N operations for an engine with inlet area A is:

$$P(X(N)=n) = \frac{e^{-\lambda AN} (\lambda AN)^n}{n!} \quad (4.4)$$

4.3 VALIDITY OF THE POISSON PROCESS MODEL FOR BIRD INGESTIONS.

The applicability of the Poisson process model can be tested by analyzing the times between ingestions. The interarrival times in a Poisson process are random variables that have independent exponential distributions and the mean time between arrivals is the reciprocal of the ingestion rate. The validity of the Poisson process model can be tested by applying a goodness-of-fit (GOF) test for the exponential distribution to the times between ingestions.

The times between ingestions are measured by the number of days between aircraft ingestion events. Normally the number of aircraft operations between aircraft ingestion events would be used; however it is impossible to measure this directly. The number of days between aircraft ingestion events provides a suitable measure of the time between ingestions since daily aircraft operations are reasonably consistent.

The GOF test for the exponential distribution is a modified Kolmogorov-mirnov (K-S) test comparing the observed cumulative distribution function (CDF) to the predicted exponential CDF based on the sample mean. The K-S test uses the test statistic D defined as the maximum distance between the observed and predicted cumulative distribution functions. A modification to the critical values for the test statistic is required when the predicted CDF is derived from the mean of the sample. The critical values for the modified K-S test were computed by Liliefors [9]. The critical value for a 0.05 level of significance when the sample size, n , is larger than 30 can be approximated by $1.06/\sqrt{n}$.

The modified K-S test was run on six subgroups of the data broken down by engine and location. The six groups were (1) domestic (United States) JT8D, (2) contiguous United States JT8D, (3) foreign JT8D, (4) domestic CFM56, (5) contiguous United States CFM56, and (6) foreign CFM56. Figures 4.2 through 4.7 compare the observed and predicted cumulative distributions for each of the six groups, respectively. In each case there is a very close visual agreement between the observed and predicted CDF's.

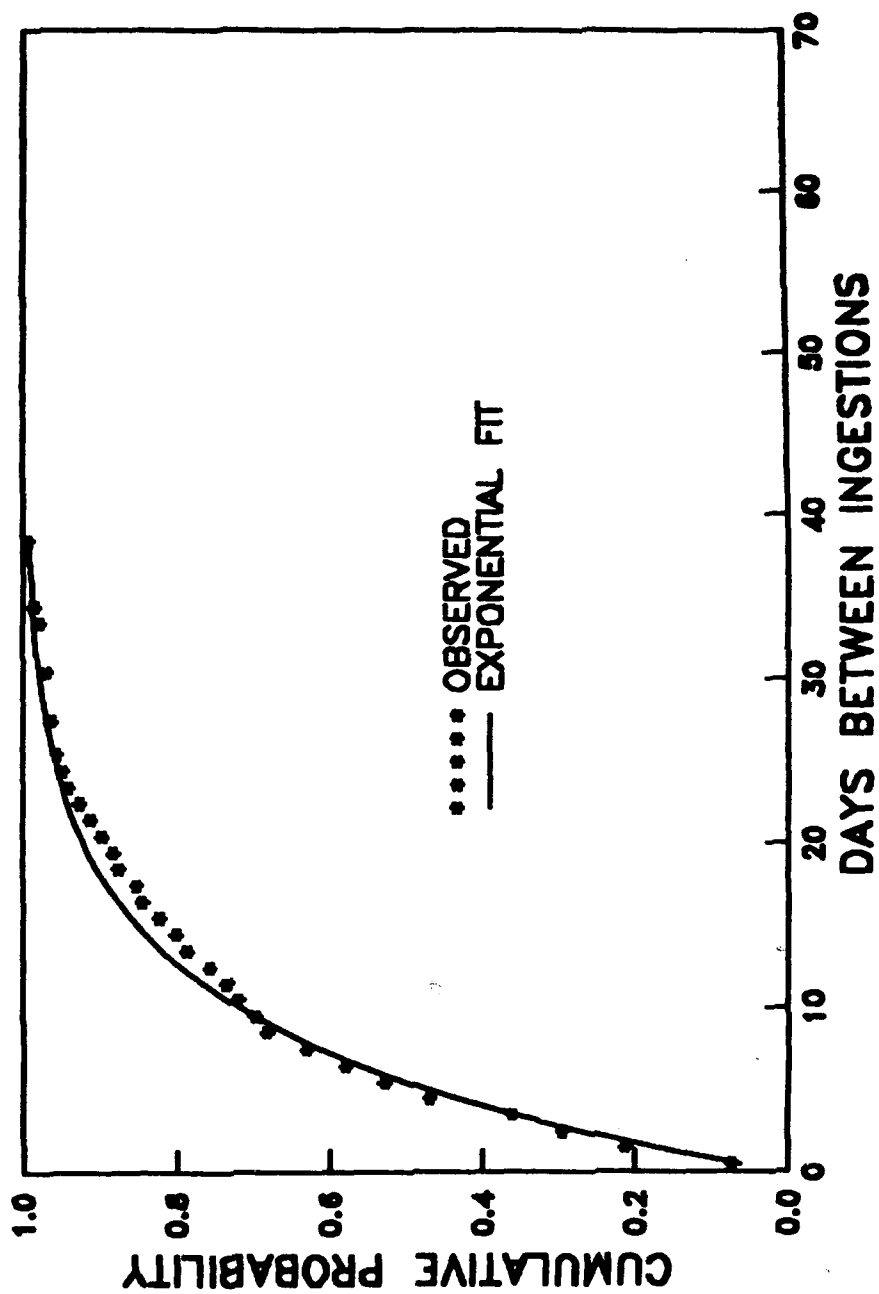


Figure 4.2. Comparison of Observed and Predicted CDFs for United States JT8D Aircraft Ingestion Events.

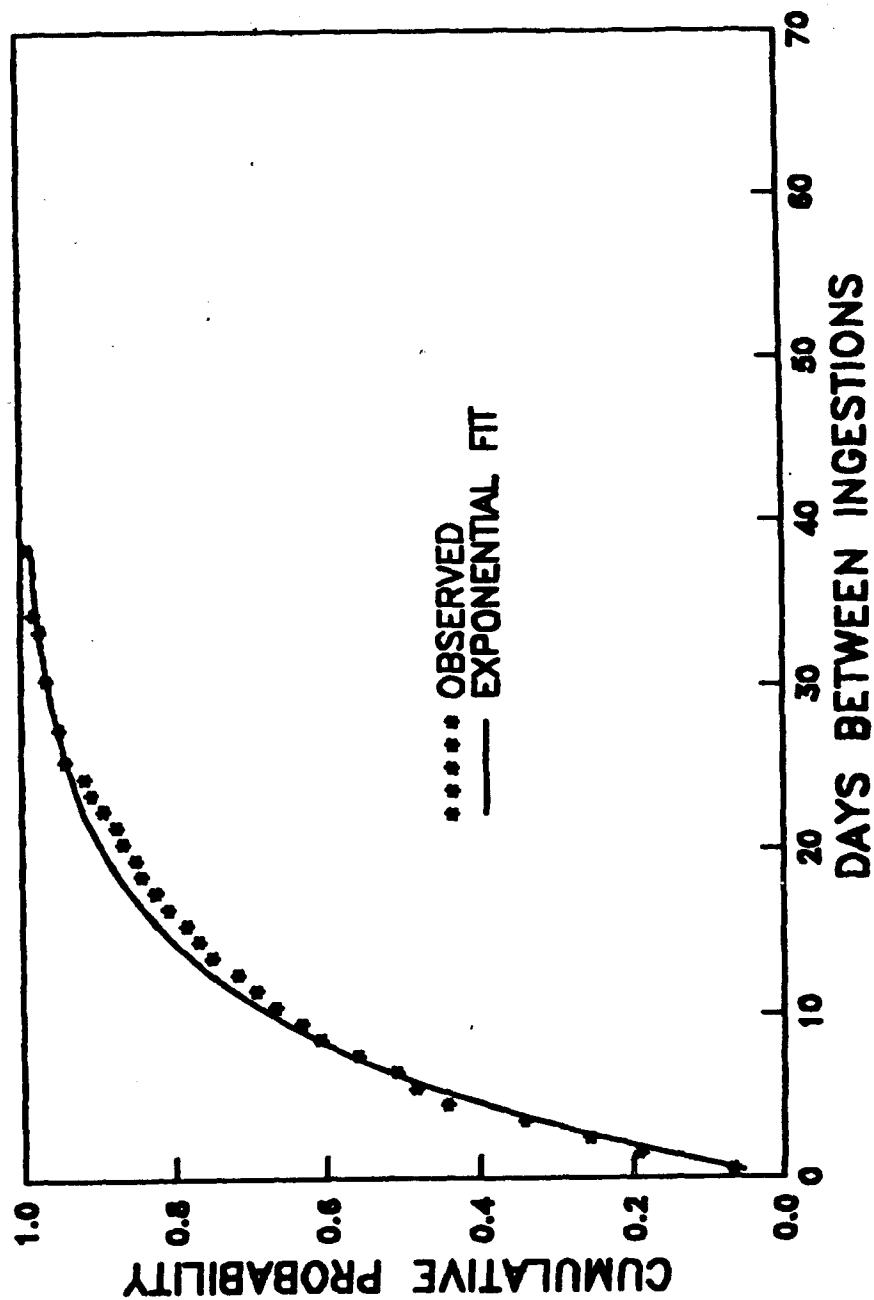


Figure 4.3. Comparison of Observed and Predicted CDFs for Contiguous United States JT8D Aircraft Ingestion Events.

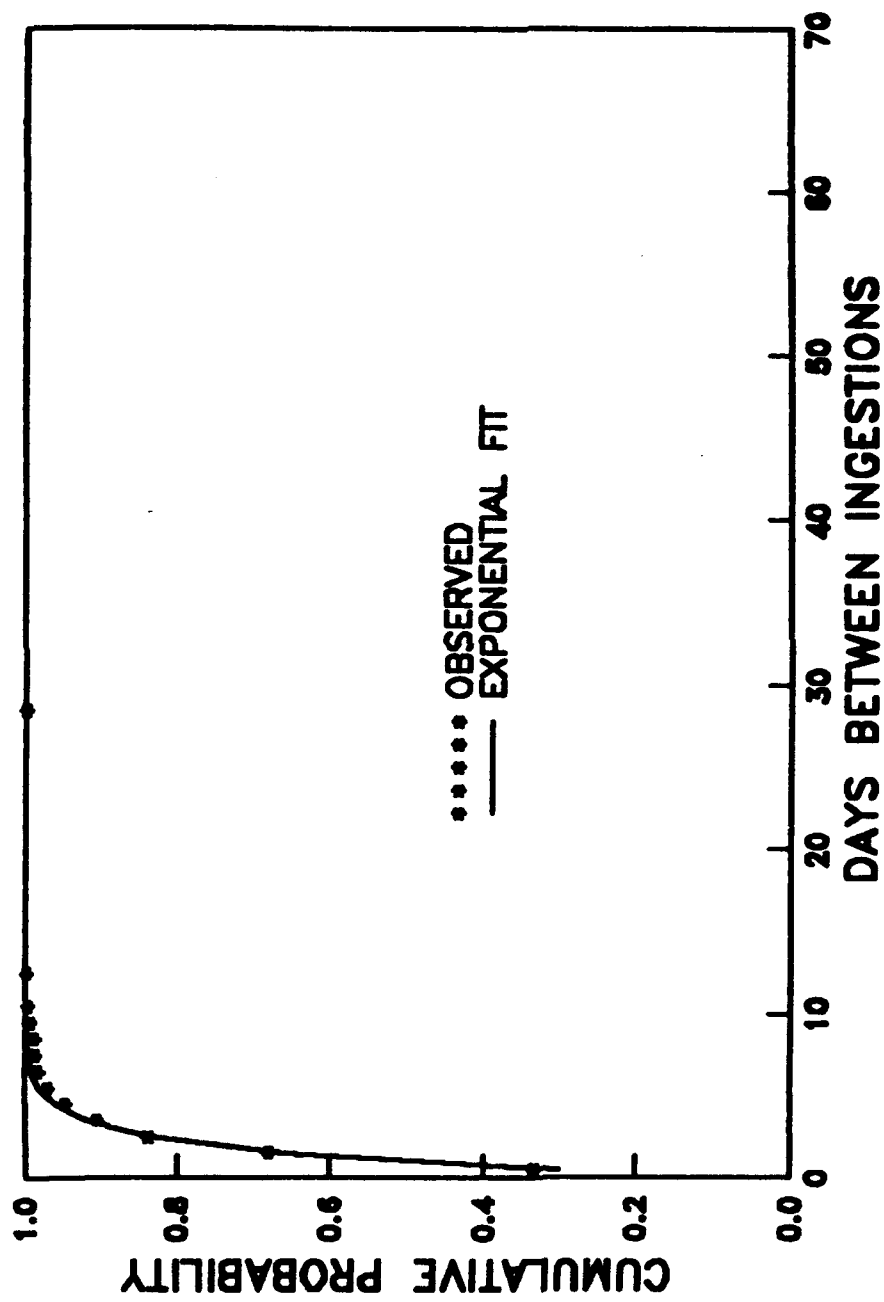


Figure 4.4. Comparison of Observed and Predicted CDFs for Foreign JT8D Aircraft Ingestion Events.

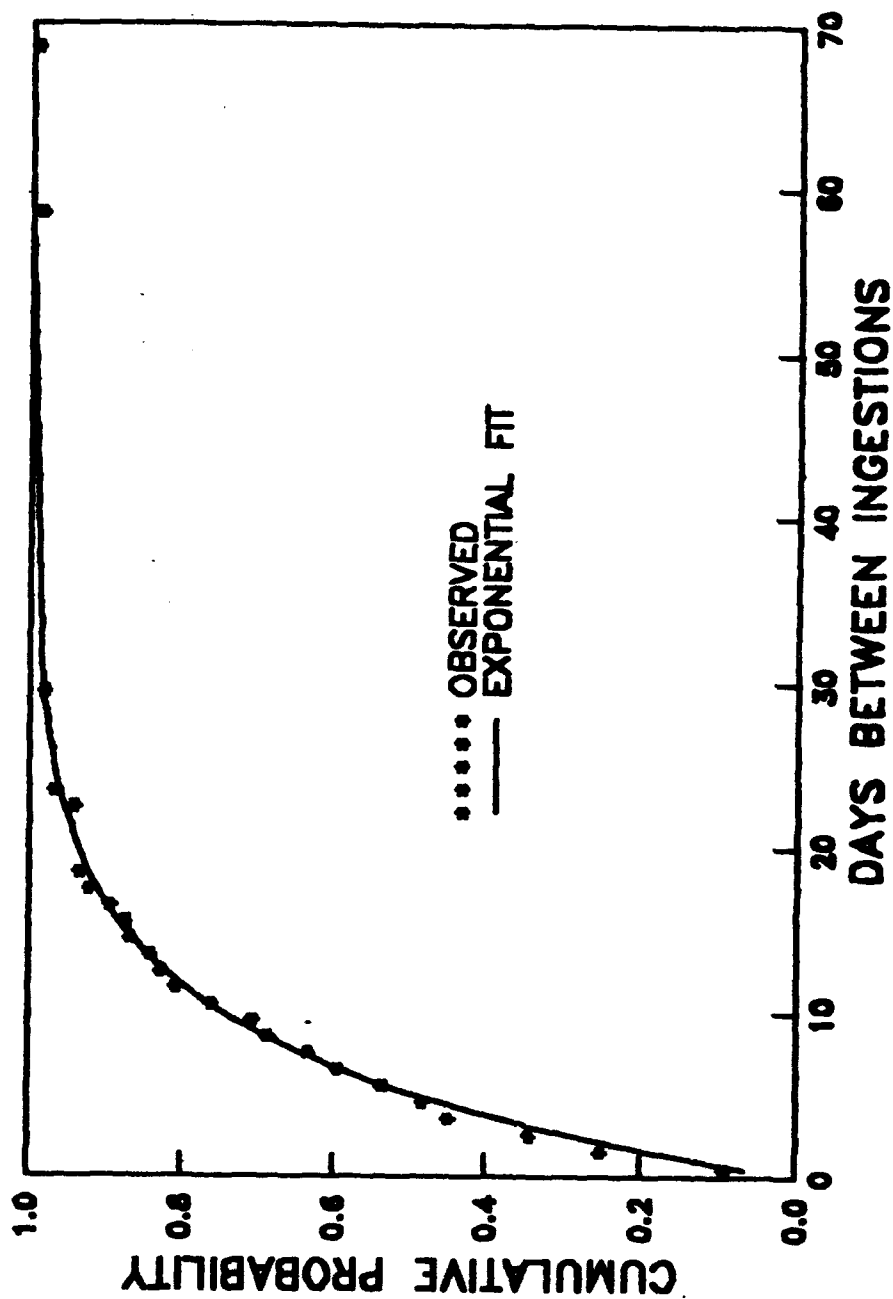


Figure 4.5. Comparison of Observed and Predicted CDFs for United States CFM56 Aircraft Ingestion Events.

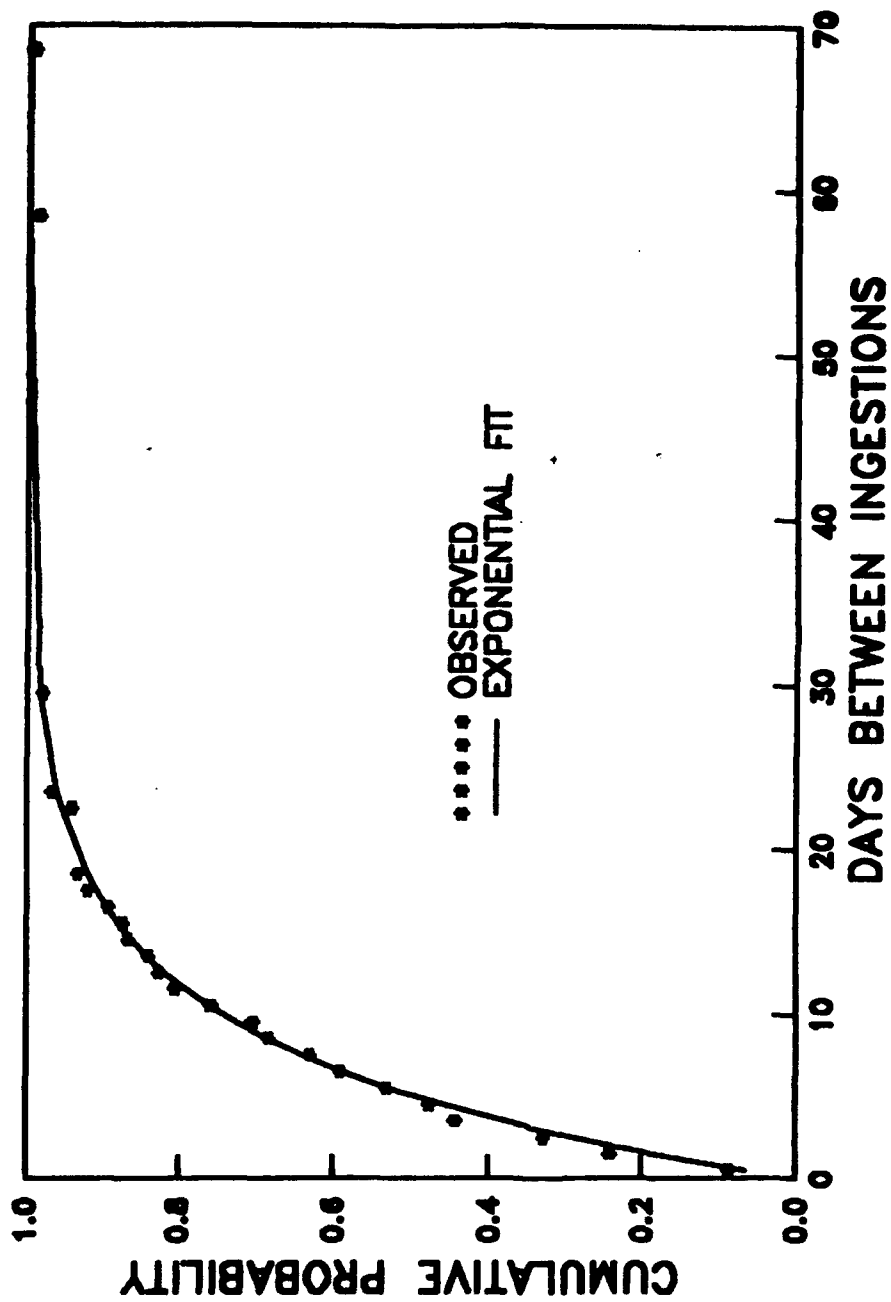


Figure 4.6. Comparison of Observed and Predicted CDFs for Contiguous United States CFM56 Aircraft Ingestion Events.

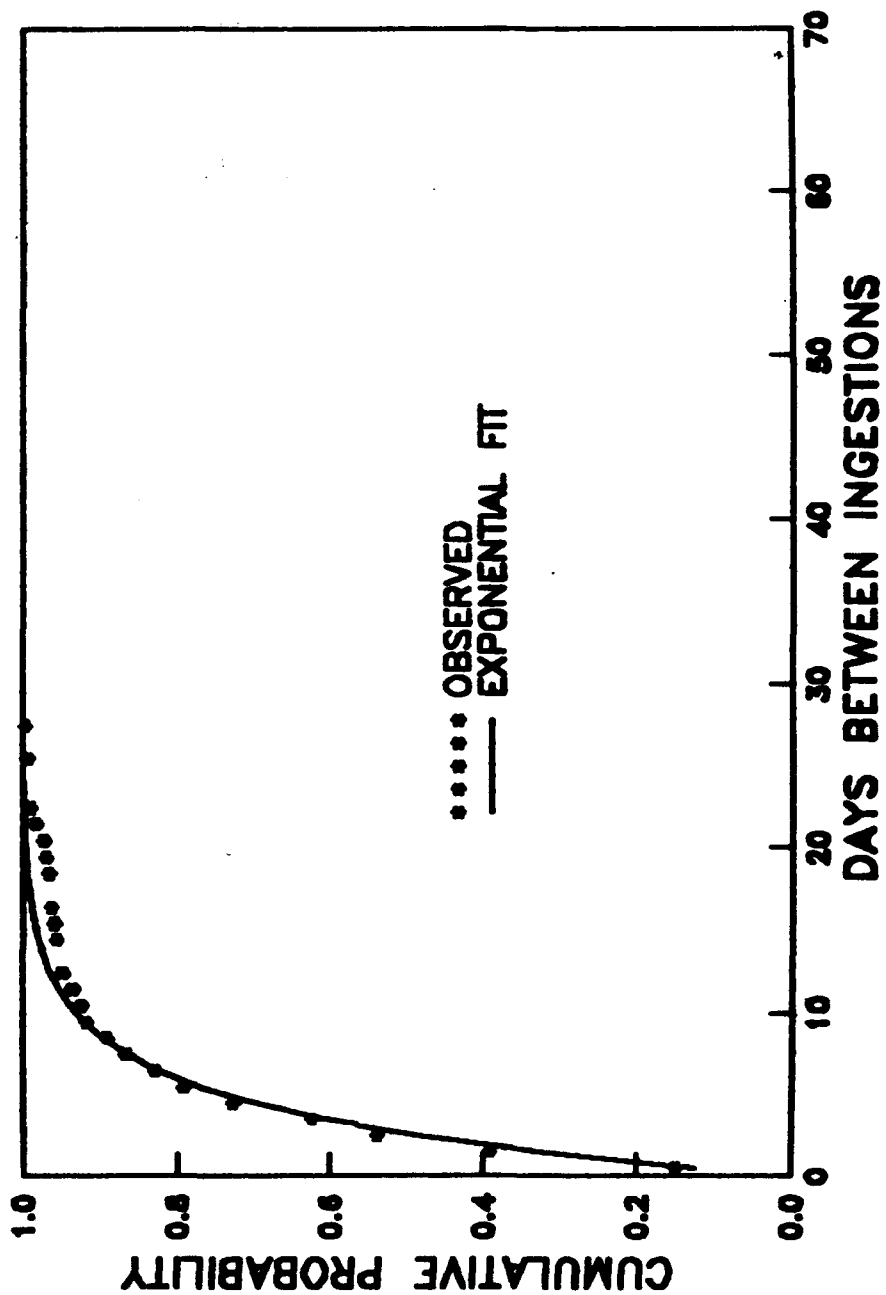


Figure 4.7. Comparison of Observed and Predicted CDFs for Foreign CFM56 Aircraft Ingestion Events.

The visual similarities are verified by the statistical tests which are summarized in Table 4.3. The mean time between ingestion events is given in column one. The sample size given in column two is the count of times between ingestions and is one less than the number of aircraft ingestion events. The critical value for a five percent significance level (D*) is in column three and the test statistic (D) is in column four. The assumption that the times between ingestion events come from an exponential distribution cannot be rejected at the five percent level in five of the six groups. The use of a Poisson process to model bird ingestions is appropriate based on these test results.

The one group that does not pass the exponential goodness of fit test is the foreign CFM56 ingestions. The test statistic for the foreign CFM56 group is nearly equal to the critical value and the maximum deviation occurs at 1.5 days. Since the time between ingestions is recorded to the nearest day, round off error could adversely affect the observed CDF at 1.5 days. Since the other five groups are consistent with the Poisson model, the failed test for the foreign CFM 56 ingestions is not sufficient cause to reject the use of the Poisson model for bird ingestion events.

4.4 INLET AREA EFFECT ON INGESTION RATES.

One property of the Poisson process model described in Section 4.2 is that ingestion rates should be proportional to the inlet area of the engine. The size effect can be investigated in the B737 bird ingestion data by comparing the number of ingestion events of the JT8D with the number of ingestion events of the CFM56. According to Equation 4.4 the total number of ingestion events during the reporting period for a given engine has a Poisson distribution with a mean that is proportional to the number of aircraft operations in the reporting period and to the inlet area of the engine. The number of JT8D ingestion events out of the total number of ingestion events will have a Binomial distribution if the Poisson process model is valid.

The proportion of total ingestion events that occurred in JT8D engines for a particular geographic region should be:

$$P = \frac{OJ \cdot AJ}{OJ \cdot AJ + OC \cdot AC} , \quad (4.5)$$

where OJ and OC are the numbers of regional aircraft operations for, and AJ and AC are the inlet areas of, the JT8D and CFM56 engines, respectively. The relevant values for Equation 4.5 can be obtained from Table 4.1A giving an expected proportion of JT8D ingestion events of $P = 0.50$ for United States ingestion events and $P = 0.62$ for foreign ingestion events. The observed proportion of JT8D events is 0.47 for the United States and 0.73 for foreign ingestion events. The test statistic to compare the observed proportion to the predicted is the standard Z statistic for the binomial distribution given by:

$$Z = (\hat{P} - P) / \sqrt{(P * (1-P) / N)} , \quad (4.6)$$

where \hat{P} is the observed proportion of JT8D engine ingestion events and N is the total number of aircraft ingestion events for the geographic region.

TABLE 4.3

RESULTS OF THE EXPONENTIAL GOF TESTS
TO VERIFY THE POISSON PROCESSJT8D ENGINE

<u>GEOGRAPHIC AREA</u>	<u>MEAN</u>	<u>SAMPLE SIZE</u>	<u>CRITICAL VALUE D*</u>	<u>TEST STATISTIC D</u>
United States	7.90	135	.091	.040
Contiguous US	8.97	119	.097	.047
Foreign	1.39	783	.037	.032

CFM56 ENGINE

<u>GEOGRAPHIC AREA</u>	<u>MEAN</u>	<u>SAMPLE SIZE</u>	<u>CRITICAL VALUE D*</u>	<u>TEST STATISTIC D</u>
United States	7.25	150	.086	.067
Contiguous US	7.34	148	.087	.064
Foreign	3.75	292	.062	.063

The Z statistic defined in Equation 4.6 is used to test the null hypothesis that there is no difference between the two types of engines in ingestion rates for each region after adjusting for area. The test statistics for the two geographic regions are computed by substituting the observed proportions for P and the expected proportions for P in Equation 4.6. The computed Z values are -0.87 for United States ingestion events and 7.310 for foreign ingestion events. The tests show no difference in ingestion rates between engines after adjusting for area for the United States events; however, the test for foreign events is significant at the five percent level of significance indicating that the area adjustment does not fully explain the observed difference in engine ingestion rates for foreign events.

A second school of thought suggests that the relationship between engine size and ingestion rate is described better as a linear function of inlet diameter than as a linear function of inlet area. A similar Z test can be computed by substituting inlet diameter for inlet area in Equation 4.5. The expected proportions of JT8D ingestion events after an adjustment for inlet diameter are $P = 0.59$ and $P = 0.70$ for the United States and foreign events, respectively. The test statistics are $Z = -3.97$ and $Z = 1.95$ for the United States and foreign events, respectively. The null hypothesis is that there is no difference in ingestion rates after adjusting for inlet diameter and the conclusion of the test is that there is no detectable difference at the five percent level of significance for the foreign events but is different for United States events.

There appears to be an engine size effect on ingestion rates; however, it is not clear whether it is best described by inlet area or diameter. The inlet area provides a good fit for the United States ingestions but not the foreign rates while inlet diameter provides a good fit for foreign rates but not for United States rates. The discrepancy could be due to differences in collection rates between the geographic regions; however, there are no data that could be used to determine whether collection rates varied geographically.

SECTION 5

AIRPORT BIRD INGESTION EXPERIENCE

The objective of the statistics of this section is to identify the frequency and location of bird ingestion events at airports worldwide. An aircraft ingestion event is the simultaneous ingestion of one or more birds by one or more engines of an aircraft. Bird ingestion data were provided by both the engine manufacturers and the ICAO. Airport ingestion rates are expressed in terms of aircraft ingestion events per 10K airport operations.

The OAG tapes indicate that there are 1,143 airports worldwide for which 17,821,706 B737 airport operations were scheduled during the reporting period. Appendix A lists the airport code, airport location, and both the number of scheduled airport operations and number of aircraft ingestion events at these airports for each of the three years in the data collection period. Bird ingestion events were reported at only 345 of these airports. The OAG tapes show that there were 12,805,445 scheduled airport operations at these 345 airports over the 3-year period. There were also bird ingestion events reported by unscheduled B737 flights at 65 additional airports. These 65 airports are included in Appendix A but there are no OAG operations counts for them.

A complete summary of the airports having reported aircraft ingestion events is presented in Table 5.1 as a frequency count of worldwide bird ingestion events by phase of flight. The majority of aircraft ingestion events occur during takeoff or landing. This table suggests that the threat of bird ingestion is posed primarily from birds which live near the airport and/or whose migratory path crosses over or near the airport property.

Figure 5.1 is a bar chart showing reported aircraft ingestion events at domestic airports during the reporting period. There are 91 domestic airports at which bird ingestion events have been reported. The largest number of aircraft ingestion events reported in the United States during the 3-year period was 10 at Dallas, Love (DAL) followed by 9 at both Houston (HOU) and Los Angeles (LAX). Of the 304 aircraft ingestion events reported in the United States, 89 events occurred at an unknown location and they are assigned to the airport code XUS on the bar chart.

Figure 5.2 is a bar chart showing reported aircraft ingestion events at foreign airports during the reporting period. There are 318 foreign airports at which bird ingestions have been reported. The largest number of aircraft ingestion events reported abroad during the period is 21 at Frankfurt, Germany (FRA) followed by 14 at Amsterdam, Netherlands (AMS). Of the 1,104 aircraft ingestion events reported outside of the United States, 265 events occurred at an unknown location and they are assigned to the airport code XFO on the bar chart.

Table 5.2 lists all airports worldwide which experienced three or more aircraft ingestion events during the reporting period. The airports are listed in descending order of airport operations. The table includes the number of ingestion events, the number of scheduled OAG airport operations, and the rate of aircraft ingestion events per 10,000 airport operations. Unscheduled B737 operations are not reflected in the operations counts,

whereas ingestion events occurring during either scheduled or unscheduled operations are included in the event counts. Therefore unscheduled B737 operations may account for the apparently higher ingestion rates.

The rates of bird ingestion events per aircraft operation summarized previously in Table 4.1A are twice the rates of bird ingestion events per airport operation. The number of reported foreign bird ingestion events exceeds the number of reported domestic ingestion events by a factor of 3.6; however, the number of foreign airport operations is slightly less than the number of domestic airport operations. The rate of reported bird ingestions per airport operation is 4.3 times higher at foreign airports than at domestic airports. This implies that either (1) there are far less birds in the environment of domestic airports, possibly due to environmental control programs, or (2) foreign airline operators are much more conscientious and cooperative in reporting bird ingestions.

TABLE 5.1
FREQUENCY COUNT OF AIRCRAFT INGESTION EVENTS BY AIRPORT AND PHASE OF FLIGHT

AIRPORT	AIRPORT DEFINITION	PARKED	TAXI	TAKEOFF	CLIMB	CRUISE	APPROACH	LANDING	UNKNOWN	TOTAL
AAE	ANABA, ALGERIA				1					1
ABCG	COOLANGATTA, AUSTRALIA							2		2
ABQ	ALBUQUERQUE, NM, USA				1					1
ACA	ACAPULCO, MEXICO			1						1
ADD	ADDIS ABABA, ETHIOPIA			1						1
ADL	ADELAIDE, SA, AUSTRALIA			2				1		2
ADQ	KODIAK, AS, USA							1		1
AEP	BUENOS AIRES - NEWBURY, ARGENTINA							2		2
AES	ALESUND, NORWAY							2		2
AGR	AGRA, INDIA			2				1		2
AJA	AJACCIO, CORSICA, FRANCE			1				1		1
AJU	ARACAJU, BRAZIL			1				1		1
AKL	AUCKLAND, NEW ZEALAND			3				1		4
ALB	ALBANY, NY, USA			1				1		2
ALC	ALICANTE, SPAIN			1			1	1		3
ALG	ALGIERS, ALGERIA						1	1		2
ALY	ALEXANDRIA, ARA REP OF EGYPT						1	1		2
AMD	AMMENDABAD, INDIA			8				1		9
AMS	AMSTERDAM, NETHERLANDS			9			1	2		12
AOR	ALOR SETAR, MALAYSIA			1			1	8		10
ARD	ALOR, INDONESIA						1			1
ASP	ALICE SPRINGS, N.T., AUSTRALIA									1
ATH	ATHENS, GREECE			1						1
ATL	ATLANTA, GA, USA									1
ATQ	AMRITSAR, INDIA			1						1
AUS	AUSTIN, TX, USA			2						2
AYT	ANTALYA, TURKEY							2		2
BAH	BAHRAIN, SAUDI ARABIA			1				1		2
BBI	BHUBANESHWAR, INDIA			2			1			3
BCN	BARCELONA, SPAIN			1				1		2
BDQ	VADODRA, INDIA			1						1
BEG	BELGRADE, YUGOSLAVIA			1						1
BFN	BLOENFONTEIN, SOUTH AFRICA			5						5
BFS	BELFAST, N. IRELAND			3				2		5
BGO	BERGEN, NORWAY			1						1
BHI	BAHIA BLANCA, ARGENTINA			2						2
BHM	BIRMINGHAM, AL, USA			1			1	1	1	4
BHO	BHOPAL, INDIA							1		1
BHX	BIRMINGHAM, ENGLAND (UK)			3				1		4
BHZ	BELO HORIZONTE, BRAZIL			1						1
BJL	BANJUL, GAMBIA			1						1
BJR	BAHAR DAR, ETHIOPIA									1
BKK	BANGKOK, THAILAND									1
BLR	BANGALORE, INDIA									1
BNA	NASHVILLE, TN, USA									1
BNE	BRISBANE, QLD, AUSTRALIA			3			1	4	1	8
BON	BONN, FRG							2		2
BOD	BORDÉAUX, FRANCE			1						1
BOH	BOURNEMOUTH, ENGLAND, UK			1						1
BOM	BOMBAY, INDIA			2			1	2	1	6
BOO	BODO, NORWAY							1		1
BOS	BOSTON, MA, USA			1				1		2
BRE	BREMEN, FED REP OF GERMANY			4				1		5
BRS	BRISTOL, ENGLAND (UK)			3				2		5
BRU	BRUSSELS, BELGIUM			7				2		12

TABLE 5.1 (CONTINUED)
FREQUENCY COUNT OF AIRCRAFT INGESTION EVENTS BY AIRPORT AND PHASE OF FLIGHT

AIRPORT	AIRPORT DEFINITION	PARKED	TAXI	TAKEOFF	CLIMB	CRUISE	APPROACH	LANDING	UNKNOWN	TOTAL
BUD	BUDAPEST, HUNGARY			1						1
BUE	BUENOS AIRES, ARGENTINA			1						1
BWI	BALTIMORE, MD, USA			1						1
CAG	CAGLIARI, ITALY			1						1
CAS	CASABLANCA, MOROCCO			2			1	1		3
CBR	CANBERRA, A.C.T., AUSTRALIA						1	2		3
CCR	CONCORD, CA, USA						1	3		4
CCU	CALCUTTA, INDIA			4			1	6		11
CDG	PARIS DE GAULLE, FRANCE			4			1	1		6
CFU	CORFU, GREECE			1	1					2
CGN	COLOGNE BONN, FRG			1				1		2
CGR	CAMP GRANDE, BRAZIL			3						3
CHC	CHRISTCHURCH, NEW ZEALAND			5				2	1	8
CID	CEDAR RAPIDS/IOWA CITY, IO, USA			1				1		2
CJB	COIMBATORE, INDIA			3						3
CJU	CHEJU, REP OF KOREA			1				1		2
CLE	CLEVELAND, OH, USA			3						3
CLT	CHARLOTTE, NC, USA			1		1		1		3
CHB	COLOMBO, SRI LANKA			1					1	2
CHG	CORUMBA, MATO GROSSO, BRAZIL			1				1		2
CND	CONSTANTO, ROMANIA			2				1		3
CNS	CAIRNS, QLD, AUSTRALIA			1					1	2
COK	COCHIN, INDIA			2				1		3
COR	CORDOBA, ARGENTINA			1						1
COS	COLORADO SPRINGS, CO, USA			1						1
CPH	COPENHAGEN, DENMARK			4						4
CPT	CAPE TOWN, SOUTH AFRICA			3						3
CRP	CORPUS CHRISTI, TX, USA			1						1
CRW	CHARLESTON, WV, USA			1						1
CTC	CATAMARCA, ARGENTINA			1						1
CTU	CHENGDU, P.R. CHINA					1		1		2
CHB	CURITIBA, PARANA, BRAZIL			1				1		2
CUL	CARDIFF, WALES, UK			2						2
CZL	CONSTANTINE, ALGERIA			1						1
DAB	DAYTONA BEACH, FL, USA			2						2
DAL	LOVE DALLS/FT. WORTH, TX, USA			5	1		2		2	10
DAY	DAYTON, OH, USA			2	2					4
DCA	NATIONAL, WASHINGTON, DC, USA			2			4	1		7
DEL	DELHI, INDIA			2				1		3
DEN	STAPLETON INT'L, DENVER, CO, USA			2			1	1		4
DET	DETROIT CITY, MI, USA			2			1	1		4
DFW	DALLAS/FT WORTH, TX, USA			1				1		2
DLH	DULUTH, MN, USA							1		1
DRW	DARWIN, N.T., AUSTRALIA							1		1
DTW	HABIB BOURGIBA, TUNISIA						1			1
DIA	CARTHAGE, TUNISIA			1						1
DTW	WAYNE CO, DETROIT, MI, USA			1			1	1		3
DUB	DUBLIN, REPUBLIC OF IRELAND			1				1		2
DUD	DUNEDIN, NEW ZEALAND			6						6
DUR	DURBAN, SOUTH AFRICA			7			1			8
DUS	DUESSELDORF, FRG			1	2					3
EAM	NEJRAN, SAUDI ARABIA				1					1
EBCL	CHARLEROI/GOSELIES, BELGIUM			1					1	2
EBOS	OOSTENDE, BELGIUM			3						3
EDI	EDINBURGH, SCOTLAND							2		2

TABLE 5.1 (CONTINUED)
FREQUENCY COUNT OF AIRCRAFT INGESTION EVENTS BY AIRPORT AND PHASE OF FLIGHT

AIRPORT	AIRPORT DEFINITION	PARKED	TAXI	TAKEOFF	CLIMB	CRUISE	APPROACH	LANDING	UNKNOWN	TOTAL
EDUO	GUTERSLOH, GERMANY							1		1
EGNV	TEES-SIDE, ENGLAND			2				1		2
EICK	CORK, IRELAND							1		1
EINN	SHANWICK, IRELAND			1						1
ELP	EL PASO, TX, USA			1	1					2
ELS	EAST LONDON, SOUTH AFRICA			2	1		1	2		5
EMA	EAST MIDLANDS, ENGLAND			1				2		4
ERI	ERIE, PA, USA			1	1			2		4
EWK	NEWARK, NEW YORK, NY, USA			2						2
EZE	BUENOS AIRES-EZEIZA ARPT, ARGENTINA			1						1
FACT	D.F. MALAN, S. AFRICA			1			1			2
FAE	FAROE ISLANDS, DENMARK						1			1
FAO	FARO, PORTUGAL			1	1			1		3
FAT	FRESNO, CA, USA			1				1		2
FAMH	WINDHOEK, STRIJDOM, NAMIBIA			1				1		2
FCO	DA VINCI, ROME, ITALY			1				1		2
FLL	FT LAUDERDALE, FL, USA			1						1
FLN	FLORTANOPOLIS, BRAZIL			1						1
FMA	FORMOSA, ARGENTINA			1						1
FMMI	IVATO, MADAGASCAR			1						1
FNC	FUNCHAL - MADEIRA, PORTUGAL			2					1	3
FNT	FLINT, MI, USA			1						1
FRA	FRANKFURT, FRG		1	7	4		4	4	1	21
FSC	FIGARI, FRANCE			1						1
FVCP	PRINCE CHARLES, ZIMBABWE			1						1
GAJ	YAMAGATA, HONSHU, JAPAN			1					1	2
GAU	GAUHATI, INDIA			2						2
GHB	GOVERNORS HARBOUR, BAHAMAS			1						1
GHU	GUALEGUAYCHU, ARGENTINA			1						1
GIG	RIO DE JANEIRO INT'L, BRAZIL			1				1		2
GLA	GLASGOW, SCOTLAND	1			1			1		3
GNTT	BOUKHAUF, MOROCCO									1
GOA	GENOA, ITALY			2				2		4
GOI	GOA, INDIA									1
GOT	GOTHENBURG, SWEDEN		1	1				1		3
GRZ	GRAZ, AUSTRIA			1				1		2
GSO	GREENSBORO/HPT/WIN-SALEM, NC, USA							1		1
GSP	GREENVILLE/SPARTANBURG, SC, USA			1				1		2
GVA	GENEVA, SWITZERLAND			1			1			2
GWL	GWALTOR, INDIZ			1						1
HAC	HACHIJO, JIMA ISLAND, JAPAN							1		1
HAI	HANOVER, FED REP OF GERMANY			2				2		4
HAM	HAMBURG, FRG			9		1	1	4		15
HKG	HONG KONG, HONG KONG			1						1
HKM	JOMO KENYATTA, NAIROBI, KENYA			1				1		2
HND	TOKYO-HANEDA, JAPAN			1						1
HNH	HANA, MAUI, HA, USA			1				3		4
HOU	HOUSTON, TX, USA			5	1			1		7
HRL	HARLINGEN, TX, USA			4			1	2	1	8
HYD	HYDERABAD, INDIA							1		1
IAD	DULLES INT'L, WASHINGTON, DC, USA									1
IAH	HOUSTON INTERCONT, TX, USA			3				2		5
IBZ	IBIZA, SPAIN			2						2
INU	NAURU, REP OF NAURU			1						1
ISA	MOUNT ISA, QLD, AUSTRALIA						1	1		2

TABLE 5.1 (CONTINUED)
FREQUENCY COUNT OF AIRCRAFT INGESTION EVENTS BY AIRPORT AND PHASE OF FLIGHT

AIRPORT	AIRPORT DEFINITION	PARKED	TAXI	TAKEOFF	CLIMB	CRUISE	APPROACH	LANDING	UNKNOWN	TOTAL
ISG	ISHIGAKI, JAPAN			5						5
ISP	LONG ISLAND MACARTHUR, NY, USA				1					1
ITO	HILO HAWAII, HA, USA			3						3
IVC	INVERCARGILL, NEW ZEALAND			1						1
IXB	BAGDOGRA, INDIA							3	1	3
IXC	CHANDIGARH, INDIA			1						1
IXE	MANGALORE, INDIA						1			1
IXJ	JAMMU, INDIA			1						1
IXR	RANCHI, INDIA			1						1
IXU	AURANGABAD, INDIA									1
IXV	ALONG, INDIA									1
IXZ	PORT BLAIR ANDAMAN ISLAND, INDIA									1
JAT	JATIPUR, INDIA				2			2	1	5
JAX	JACKSONVILLE, FL, USA			1						1
JDH	JODHPUR, INDIA			1		1				2
JNB	JOHANNESBURG, SOUTH AFRICA			4				1		5
JRH	JORHAT, INDIA			1					1	2
JRO	KILIMANJARO, TANZANIA			1						1
KCH	KUCHING, SARAWAK, MALAYSIA			1	1					2
KEF	REYKJAVIK-KEFLAVIK, ICELAND			1						1
KGS	KOS, GREECE			1						1
KHH	KAOHSIUNG, TAIWAN			1						1
KHI	KARACHI, PAKISTAN			2						2
KIM	KIMBERLEY, SOUTH AFRICA			2						2
KMG	KUNMING, P.R. CHINA			1						1
KOA	KONA, HA, USA			1						1
KOJ	KAGOSHIMA, JAPAN								2	2
KRP	KARUP, DENMARK							1		1
KRT	KHARTOUM, SUDAN			1						1
KST	KOSTI, SUDAN						1			1
KTM	KATHMANDU, NEPAL									1
KUL	KUALA LUMPUR, MALAYSIA									1
LAS	LAS VEGAS, NV, USA			1						1
LAX	LOS ANGELES, CA, USA		1	6						7
LBB	LUBBOCK, TX, USA									1
LCA	LARNACA, CYPRUS				1					1
LDE	LOURDES/TARBES, FRANCE			5						5
LEAH	ALMERIA, SPAIN						1			1
LEGE	COSTA BRAVA, SPAIN									1
LEMG	MALAGA, SPAIN			1						1
LEMH	MENORCA, SPAIN			1						1
LEPS	REUS, SPAIN			1			1			2
LEX	LEXINGTON, KY, USA			1						1
LFBO	BLAGNAC, FRANCE			3						3
LGA	NEW YORK LA GUARDIA, NY, USA			1						1
LGG	LIEGE, BELGIUM							3		3
LGRP	PARADISI, GREECE									1
LGRX	ARAXOS, GREECE									1
LGSK	SKIATHOS, GREECE			1						1
LGW	LONDON-GATWICK, ENGLAND			3	3		2			8
LHE	LAHORE, PAKISTAN			3	1				1	5
LHR	LONDON HEATHROW, ENGLAND, (UK)			4			4			8
LIN	LIHUE, KAUAI, HA, USA			2						2
LIL	LILLE, FRANCE			2						2
LIN	MILAN LINATE, ITALY			3						3

TABLE 5.1 (CONTINUED)
FREQUENCY COUNT OF AIRCRAFT INGESTION EVENTS BY AIRPORT AND PHASE OF FLIGHT

AIRPORT	AIRPORT DEFINITION	PARKED	TAXI	TAKEOFF	CLIMB	CRUISE	APPROACH	LANDING	UNKNOWN	TOTAL
LIPE	BORG PANICALE, ITALY			1						1
LIPZ	TESSERA, ITALY			1						1
LIS	LISBON, PORTUGAL			1				2		3
LIT	LITTLE ROCK, AK, USA			2	2					4
LJU	LJUBLJANA, YUGOSLAVIA			1				2		1
LKO	LUCKNOW, INDIA			3						5
LLW	LILONGWE, MALAWI			1				2		1
LLZ	LONZ, AUSTRIA			2				2		4
LOS	LAGOS, NIGERIA			1					1	2
LOW	WIEN-SCHWEICHTAT, OSTERREICH									3
LPA	GRAN CANARIA, CANARY ISLANDS					2		1		3
LPL	LIVERPOOL, ENGLAND							1	1	2
LST	LAUNCESTON, TASMANIA, AUSTRALIA			1	1			1		3
LTBS	MUGLA, TURKEY			2				4		7
LTN	LONDON-LUTON INT'L, ENGLAND			3						3
LXR	LUXOR, ARAB REP OF EGYPT			1						1
LXS	LEMHOS, GREECE			2						2
LYS	LYON, FRANCE			1				1		2
MAA	MADRAS, INDIA			4	1			1		7
MAD	MADRID, SPAIN			1	1			1		3
MAF	MIDLAND ODESSA, TX, USA			2				1		3
MAH	MAHON, MENORCA, SPAIN			1				1		2
MAN	MANCHESTER, ENGLAND (UK)			1				1		2
MCO	ORLANDO-INT'L, FL, USA			4		1				5
MOP	MINDIPTANA, INDONESIA			1				1		2
MOQ	MAR DEL PLATA, ARGENTINA			2				1		3
MOT	HARRISBURG-OLMSTEAD ST, PA, USA			1						1
MOV	CHICAGO-MIDWAY, IL, USA			6		1				7
MED	MEDINA, SAUDI ARABIA			1						1
MEL	MELBOURNE, VICTORIA, AUSTRALIA			2	3			1		6
MFR	MEDFOR, OR, USA			1						1
MGA	MANAGUA, NICARAGUA			1				1		2
MIA	MIAMI, FL, USA			1						1
MIL	MILAN, ITALY			1				1		2
MIA	MALTA, MEDITERRANEAN SEA							1		1
MLA	LUQA, MALTA							1		1
MLL	MIYAKO JIMA, JAPAN			6				4		10
MMY	MISSOULA, MT, USA			1				1		2
MSP	MINNEAPOLIS-ST PAUL, MN, USA			2				1		3
MSY	NEW ORLEANS, LA, USA			3				1		4
MUC	MUNICH, FRG			1	1		2	1		5
MVD	MONTVIDEO, URUGUAY			1	3			2		6
MXP	MILAN-MALPENSA, ITALY			1						1
MYR	MYRTLE BEACH, SC, USA			1						1
NAP	NAPLES, ITALY									1
NCE	NICE, FRANCE			2			2	5		9
NCL	NEWCASTLE, ENGLAND							2	1	3
NGO	NAGOYA, JAPAN			2						2
NUE	NUREMBERG, FRG			1						1
OAK	OAKLAND, SAN FRANCISCO, CA, USA			2	1			2		5
OGG	KAHULUI, MAUI, HA, USA			2						2
OIT	OTTA, JAPAN			1				1		2
OKC	OKLAHOMA CITY, OK, USA			1						1
OPO	OPORTO, PORTUGAL			1						1
OPN	CHAKLALA, PAKISTAN			1						1

TABLE 5.1 (CONTINUED)
FREQUENCY COUNT OF AIRCRAFT INGESTION EVENTS BY AIRPORT AND PHASE OF FLIGHT

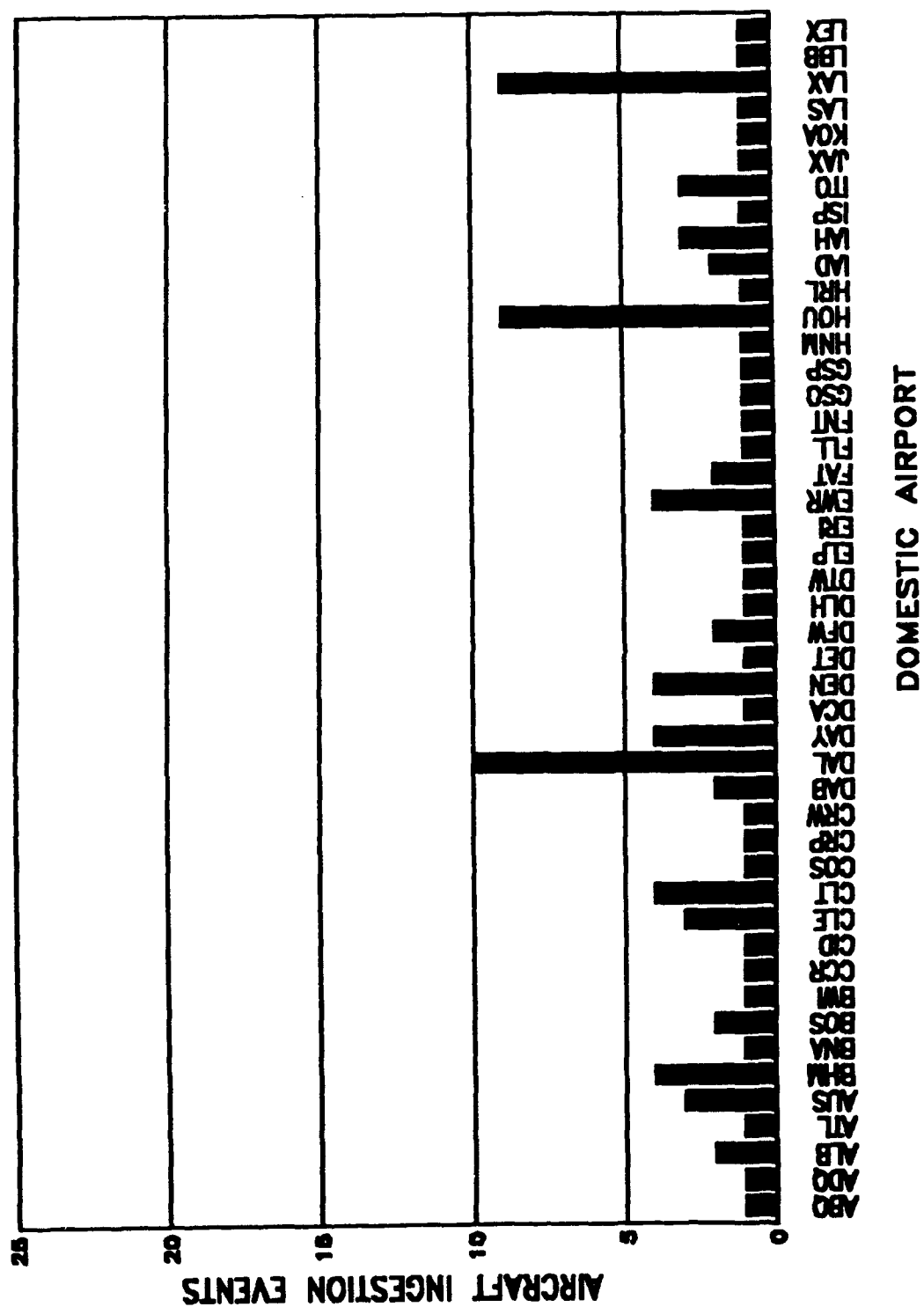
AIRPORT	AIRPORT DEFINITION	PARKED	TAXI	TAKEOFF	CLIMB	CRUISE	APPROACH	LANDING	UNKNOWN	TOTAL
ORD	CHICAGO-O'HARE, IL, USA			4	1			1		6
ORF	NORFOLK-VA, BEACH, VA, USA			2				3		5
ORY	PARIS - ORLY ARPT, FRANCE			5				1		5
OSL	OSLO, NORWAY			1				3		5
PAT	PATNA, INDIA			4				1	1	6
PDB	PEDRO BAY, AS, USA			1						1
PDX	PORTLAND, OR, USA			1	1			2		4
PEK	BEIJING, P. R. CHINA		1	1				1		3
PEN	PENANG, MALAYSIA			1	1			1		3
PER	PERTH, WA, AUSTRALIA			1	2			2		5
PHL	PHILADELPHIA/WILMINGTON, PA, USA					1				1
PHX	PHOENIX, AZ, USA									1
PIC	TAMPA-ST. PETERSBURG, FL, USA			5	1			2		8
PLZ	PORT ELIZABETH, SOUTH AFRICA			4				1		5
PME	PORTSMOUTH, UK			1	1			1		3
PNI	PALMA MALLORCA ISLAND, SPAIN			3				1		4
PHO	PALERMO, ITALY			1	1			1		3
PMR	PALMERSTON, NEW ZEALAND			1	1			2		4
PNA	PAMPLONA, SPAIN					1				1
PSA	PISA, ITALY									1
PST	PANAMA CITY, PANAMA			1						1
PUY	PULA, YUGOSLAVIA			1						1
PVD	PROVIDENCE, RI, USA			1						1
PVH	PORTO VELHO, BRAZIL			2						2
PVK	PREVEZA/LEFKAS, GREECE							1		1
PMI	PORTLAND, ME, USA							1		1
QTV	TREVISO, ITALY							1		1
RAP	RAPID CITY, SD, USA			1						1
RBA	RABAT, MOROCCO			2				1		3
REC	RECIFE, BRAZIL			1		1			1	3
RES	RESISTENCIA, ARGENTINA			1						1
RKPC	CHENJU, KOREA			1						1
RNO	RENO, NV, USA			1	1					2
ROA	ROANOKE, VA, USA			1						1
ROC	ROCHESTER, NY, USA			1		1				2
ROK	ROCKHAMPTON, QLD, AUSTRALIA			1		1				2
RST	ROCHESTER, MN, USA			1						1
RUH	RIYADH, SAUDI ARABIA			1				1		2
SAB	SABA, NETH. ANTILLES			1				1		2
SAL	SAN SALVADOR, EL SALVADOR			1						1
SAN	SAN DIEGO, CA, USA				1					1
SAO	SÃO PAULO, BRAZIL				1					1
SAT	SAN ANTONIO, TX, USA			2					1	3
SAV	SAVANNAH, GA, USA			1						1
SCC	PRUDHOE BAY, DEADHORSE, AS, USA							1		1
SCN	SAARBRUECKEN, FRG			1		1				2
SDF	LOUISVILLE, KY, USA									1
SDJ	SENDAI, JAPAN								1	1
SFO	SANTA FE, ARGENTINA							1		1
SFM	SAN FRANCISCO-OAKLAND, CA, USA			3	2			1	1	7
SHI	SHIMOJISHIMA, JAPAN									1
SJC	SAN JOSE, CA, USA			2			1	1		4
SLA	SALT, ARGENTINA			1						1
SLC	SALT LAKE CITY, UT, USA					1				1
SLL	SALALAH, OMAN			1						1

TABLE 5.1 (CONTINUED)
FREQUENCY COUNT OF AIRCRAFT INGESTION EVENTS BY AIRPORT AND PHASE OF FLIGHT

AIRPORT	AIRPORT DEFINITION	PARKED	TAXI	TAKEOFF	CLIMB	CRUISE	APPROACH	LANDING	UNKNOWN	TOTAL
SLZ	SAO LUIZ, MARANHAO, BRAZIL			1						1
SMF	SACRAMENTO, CA, USA			1			2			3
SMT	SAMOS ISLAND, GREECE						1			1
SNA	ORANGE COUNTY, CA, USA			1						1
SRQ	SARASOTA/BRADENTON, FL, USA			2				1		2
STN	LONDON-STANSTED, ENGLAND, UK			1						1
STO	STOCKHOLM, SWEDEN			3				3		7
STR	STUTTGART, FRG			1						1
STV	SURAT, INDIA			1						1
SVG	STAVANGER, NORWAY			1						1
SVO	MOSCOW-SHEREMETYEVO, U.S.S.R.			1				2		3
SXR	SRINAGAR, INDIA			2				1		3
SYD	SYDNEY, N.S.W., AUSTRALIA			1				1		2
SYR	SYRACUSE, NY, USA		1	1				2		3
SZG	SALZBURG, AUSTRIA							2		2
TBT	TABATINGA, BRAZIL						1			1
TCI	TENERIFE, CANARY IS.			2						2
TFS	TENERIFFE-REINASOFIA, CANARY ISLAND			1						1
TGD	TITOGRADE, YUGOSLAVIA			1						1
TIP	TRIPOLI, LIBYA			1						1
TLS	TOULOUSE, FRANCE			2						2
TLV	TEL AVIV-YAFO, ISRAEL			1						1
TNG	TANGIER, MOROCCO			3			1			4
TPA	TAMPA/SF PETERSBURG, FL, USA			1						1
TRD	TRONDHEIM, NORWAY			1						1
TRM	TURIN, ITALY			1						1
TRV	TRIVANDRUM, INDIA			1				5		6
TSF	TREVISO, ITALY			1						1
TSV	TOWNSVILLE, QLD, AUSTRALIA			3				1		4
TTJ	TOTTORI, JAPAN			1						1
TUC	TUCUMAN, ARGENTINA		1	1			1			3
TUL	TULSA, OK, USA			3						3
TUN	TUNIS, TUNISIA			1				1		2
TVL	LAKE TAHOE, CA, USA			1						1
TXL	WEST BERLIN, GERMANY			1				1		2
UDR	UDAIPUR, INDIA									
UET	QUETTA, PAKISTAN									
UTN	UPINGTON, SOUTH AFRICA			3						3
VAKJ	KHAJURAHO, INDIA		1	1						2
VCE	VALVERDE, CANARY ISLANDS			4			1			5
VDM	VIENNA, ARGENTINA									
VIE	VIENNA, AUSTRIA									
VNS	VARANASI, INDIA			2				2		4
VOTR	TIRUCHCHIRAPPALLI, INDIA			1				4		5
VTZ	VISHAKHAPATNAM, INDIA			1				1		2
WAW	WARSAW, POLAND									
WBSB	BRUNEL INTL, MALAYSIA			1				1		2
WDH	WINDHOEK, NAMIBIA			1						1
WLG	WELLINGTON, NEW ZEALAND			3						3
XFO	UNKNOWN FOREIGN AIRPORT			14						14
XWH	XIAMEN, P. R. CHINA			2						2
XRY	JEREZ DE LA FRONTERA, SPAIN			1						1
XUS	UNKNOWN USA AIRPORT		1	1						2
YAM	SAULT STE MARIE, ONT., CANADA			1						1
YCG	CASTLEGAR, BC, CANADA			1						1

TABLE 5.1 (CONCLUDED)
FREQUENCY COUNT OF AIRCRAFT INGESTION EVENTS BY AIRPORT AND PHASE OF FLIGHT

AIRPORT	AIRPORT DEFINITION	PARKED	TAXI	TAKEOFF	CLIMB	CRUISE	APPROACH	LANDING	UNKNOWN	TOTAL
YHY	MAY RIVER, NWT, CANADA			2				2		2
YHZ	HALIFAX, NS, CANADA			1						1
YKA	KAMLOOPS, BC, CANADA			1		1				2
YLB	KELOWNA, BC, CANADA			1						1
YMM	FT MCMURRAY, ALTA, CANADA			1				1		2
YOW	OTTAWA, ONT, CANADA			2						2
YQB	QUEBEC, QUE, CANADA			1						1
YQR	REGINA, SASK, CANADA			1						1
YQT	THUNDER BAY, ONT, CANADA			1						1
YSM	FT SMITH, NWT, CANADA			1						1
YUL	MONTREAL, QUEBEC, CANADA			5				2		7
YVO	VAL D'OR, QUE, CANADA			1						1
YVQ	NORMAN WELLS, NWT, CANADA			1						1
YVR	VANCOUVER, BC, CANADA					1		5	1	7
YWG	WINNIPEG, MAN, CANADA			3						3
YXD	EDMONTON-MUNICIPAL, ALBERTA, CANADA			1				1		2
YXJ	FT ST JOHN, BC, CANADA			3						3
YXS	PRINCE GEORGE, BC, CANADA			2				1		3
YYC	CALGARY, ALBERTA, CANADA			4				2		6
YYJ	VICTORIA, BC, CANADA			1				1		2
YYT	ST JOHNS, NFLD, CANADA			1						1
YYZ	TORONTO, ONTARIO, CANADA			2		1				3
YZF	YELLOWKNIFE, NWT, CANADA			1				1		2
YZP	SANDSPIT, BC, CANADA			1				2		3
ZRH	ZURICH, SWITZERLAND						1	1		2
ZTH	ZAKINTHOS, GREECE					2		1		3
-0-	AIRPORT UNKNOWN			1					6	7
	AIRPORTS WITH KNOWN INGESTIONS	1	10	555	85	15	86	301	357	1410



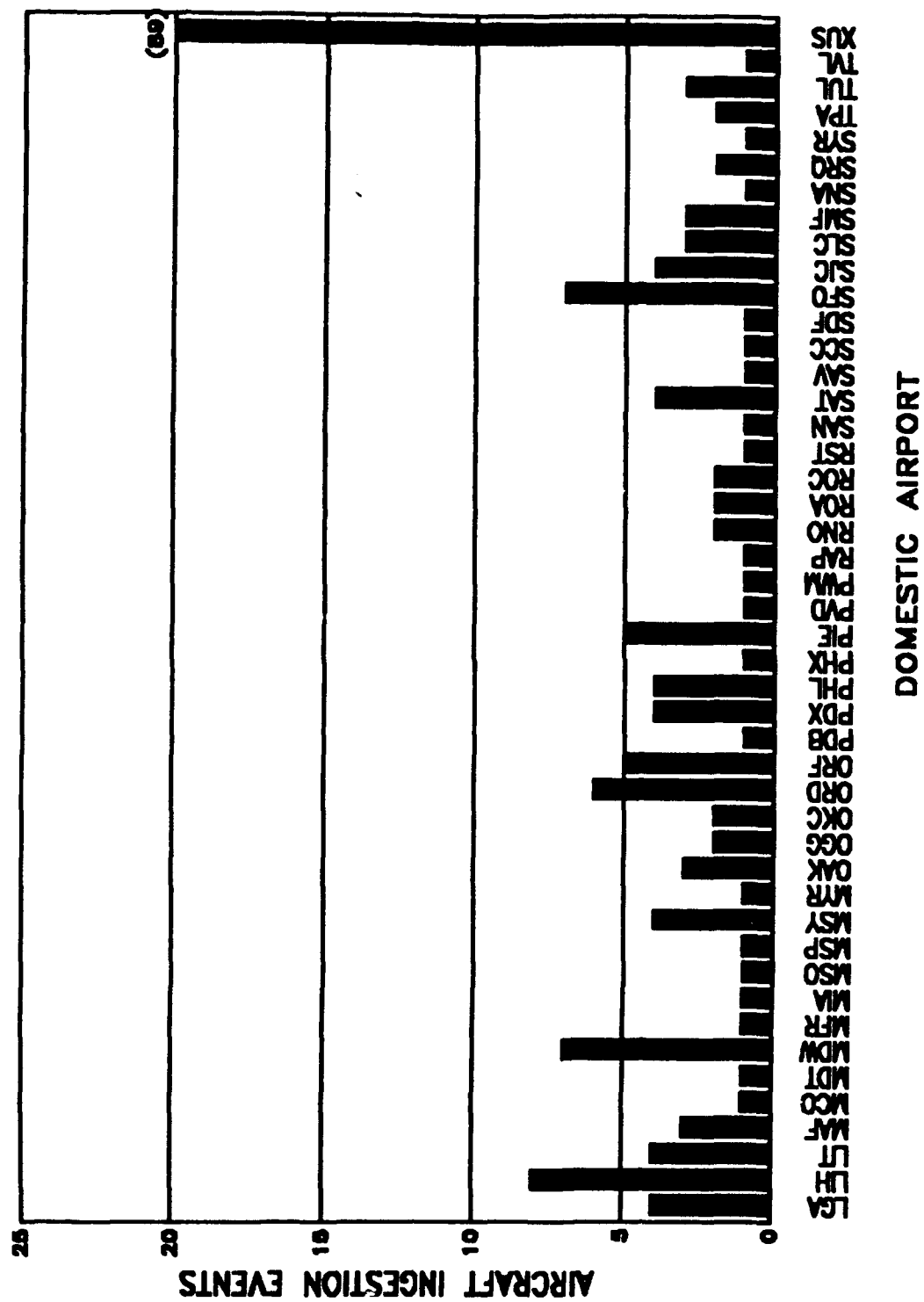


Figure 5.1. Histogram of Aircraft Ingestion Events at Domestic Airports. (Concluded)

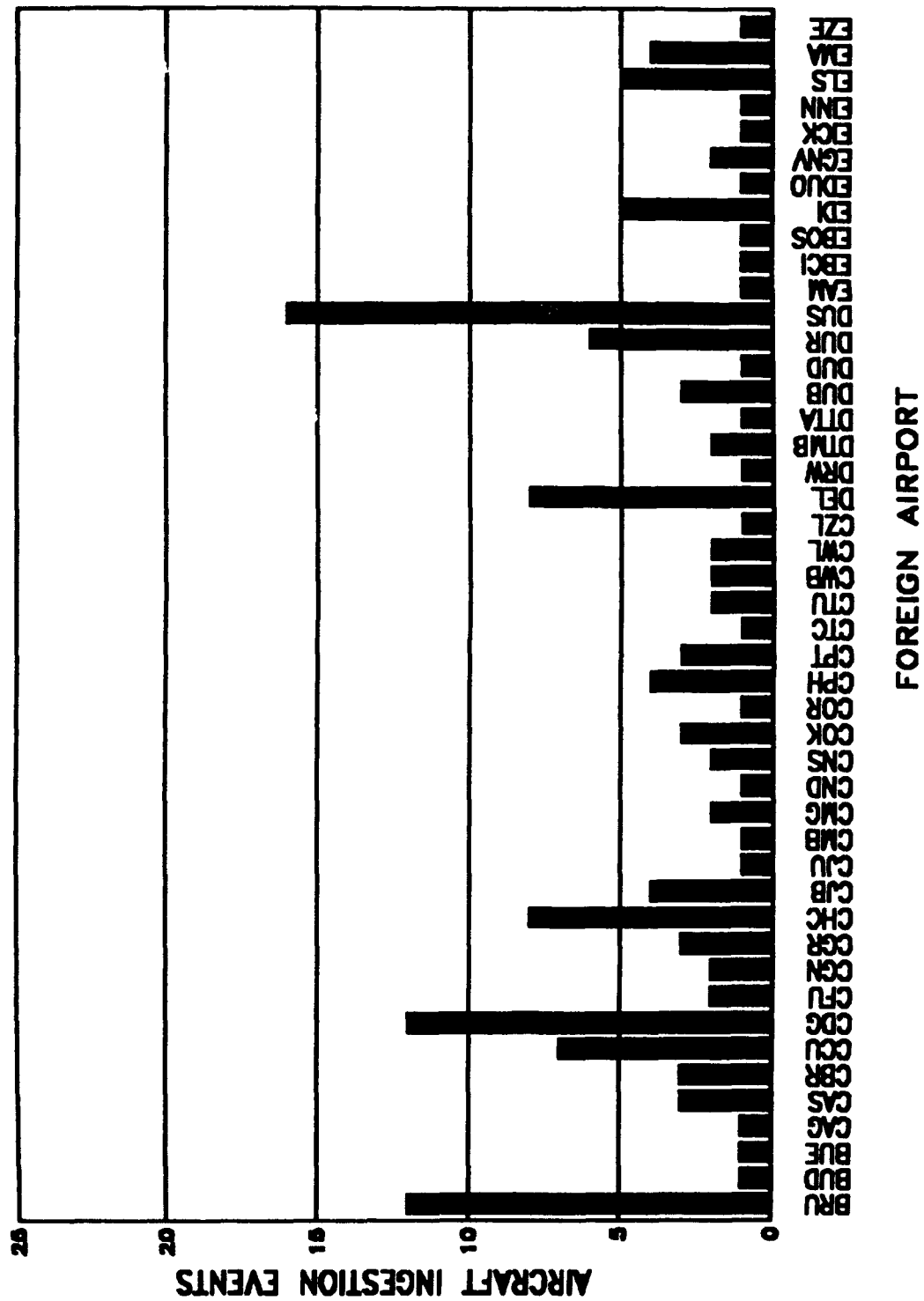
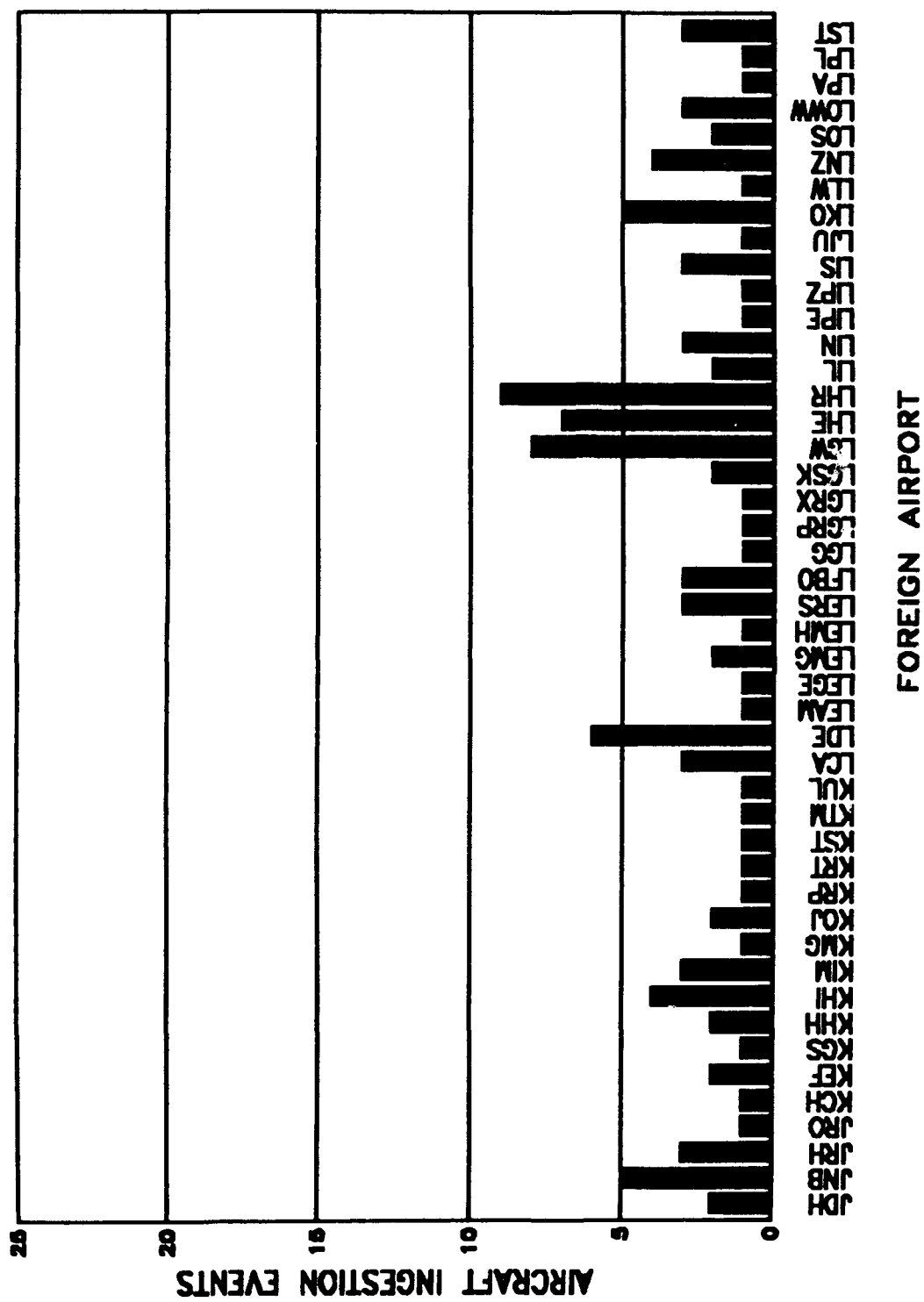


Figure 5.2. Histogram of Aircraft Ingestion Events at Foreign Airports. (Continued)



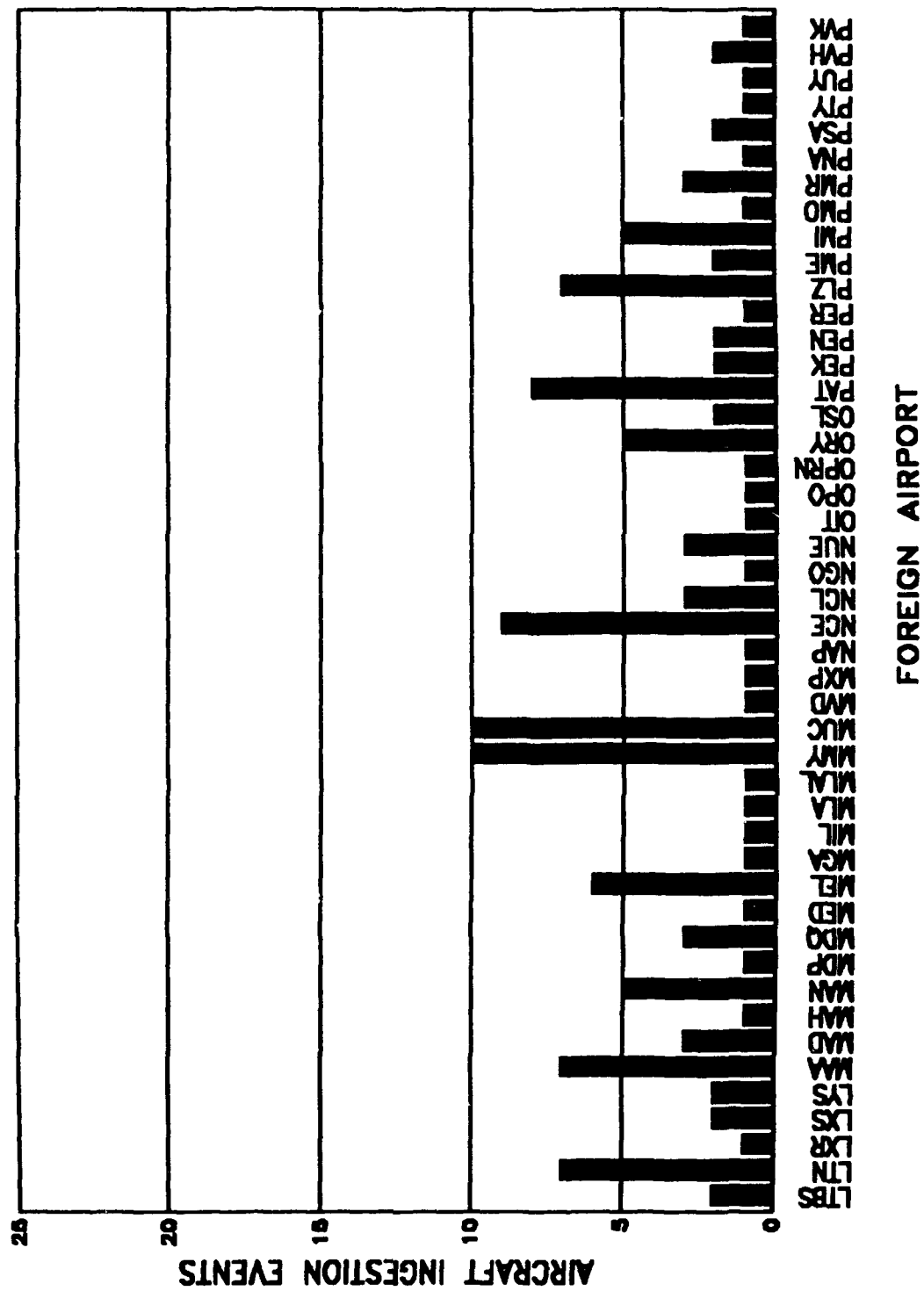


Figure 5.2. Histogram of Aircraft Ingestion Events at Foreign Airports. (Continued)

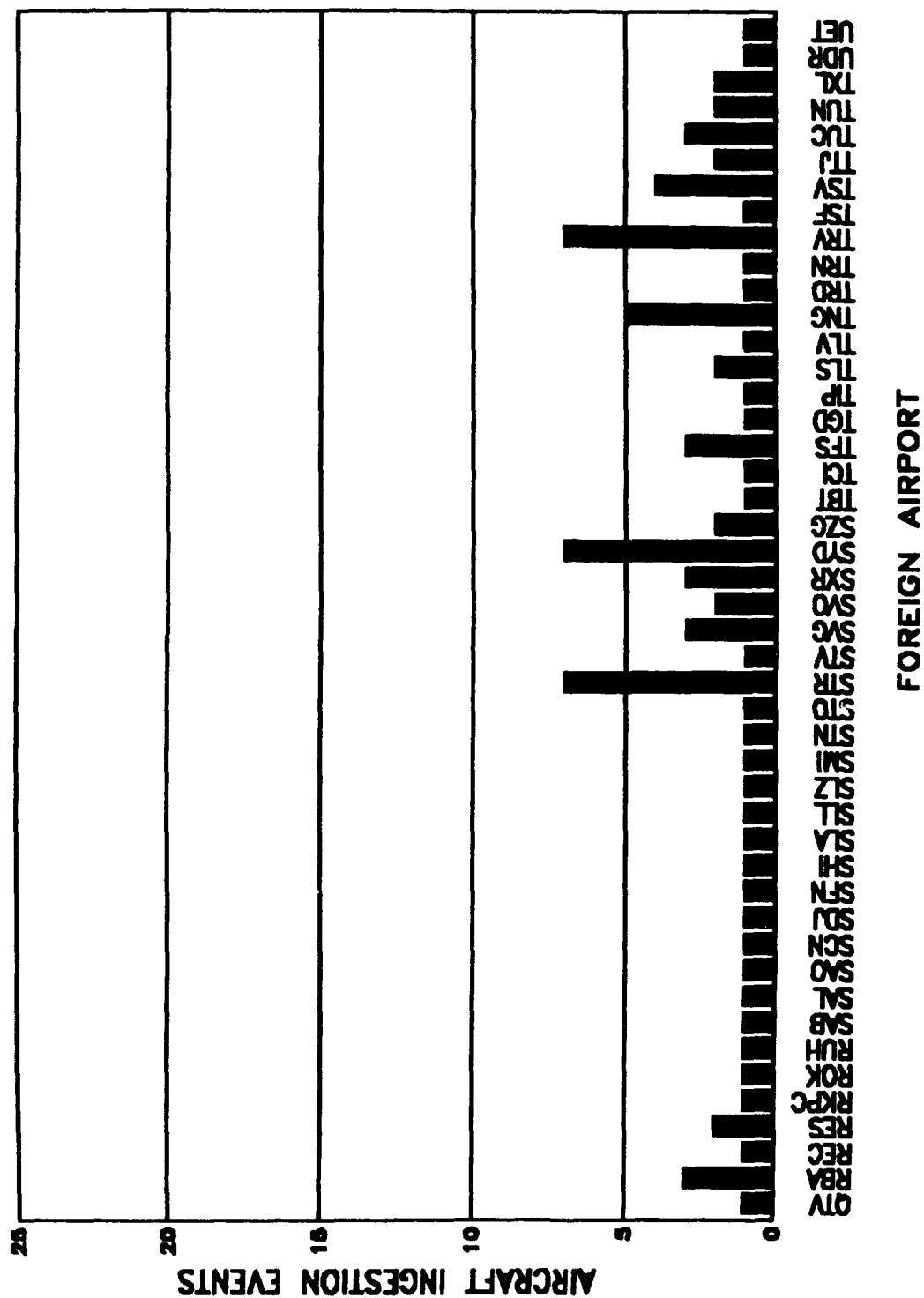


Figure 5.2. Histogram of Aircraft Ingestion Events at Foreign Airports. (Continued)

TABLE 5.2 AIRPORT BIRD INGESTION RATES

(3 Or More Aircraft Ingestion Events)

Airport Code	Airport Operations	Ingestion Events	Ingestion Rate Events/10K Ops	Airport Location
LAX	355,538	9	0.25	LOS ANGELES, CA, USA
DEN	332,616	4	0.12	STAPLETON INT'L, DENVER, CO, USA
CLT	331,001	4	0.12	CHARLOTTE, NC, USA
SFO	254,777	7	0.27	SAN FRANCISCO-OAKLAND, CA, USA
ORD	249,037	6	0.24	CHICAGO-O'HARE IL, USA
HR	247,201	4	0.16	NEWARK, NEW YORK, NY, USA
LHR	238,809	9	0.38	HOUSTON, TX, USA
DAL	227,610	9	0.38	LONDON HEATHROW, ENGLAND, (UK)
SLC	221,234	10	0.44	LOVE DALLS/FT WORTH, TX, USA
FRA	172,698	3	0.14	SALT LAKE CITY, UT, USA
YYZ	136,511	21	1.22	FRANKFURT, FRG
MDW	128,958	3	0.22	TORONTO, ONTARIO, CANADA
DAY	128,873	7	0.54	CHICAGO-MIDWAY, IL, USA
MUC	127,730	4	0.31	DAYTON, OH, USA
PHL	125,578	10	0.78	MUNICH, FRG
IAH	124,385	4	0.32	PHILADELPHIA/WILMINGTON, PA, USA
CLE	119,819	3	0.24	HOUSTON INTERCONT, TX, USA
SJC	112,356	3	0.25	CLEVELAND, OH, USA
YVR	109,876	4	0.36	SAN JOSE, CA, USA
SAT	101,879	7	0.64	VANCOUVER BC, CANADA
LGA	100,997	4	0.39	SAN ANTONIO, TX, USA
BRU	100,800	4	0.40	NEW YORK LA GUARDIA, NY, USA
AUS	96,991	12	1.19	BRUSSELS, BELGIUM
DUS	96,533	13	0.31	AUSTIN, TX, USA
YYC	96,280	16	1.66	DUESSELDORF, FRG
MSY	91,572	6	0.62	CALGARY, ALBERTA, CANADA
AMS	89,704	4	0.44	NEW ORLEANS, LA, USA
CDG	86,983	20	2.23	AMSTERDAM, NETHERLANDS
TUL	85,274	12	1.38	PARIS DE GAULLE, FRANCE
HAM	80,971	3	0.35	TULSA, OK, USA
OAK	77,470	15	1.85	HAMBURG, FRG
WLG	75,242	3	0.39	OAKLAND, SAN FRANCISCO, CA, USA
DUB	71,650	4	0.53	WELLINGTON, NEW ZEALAND
SYD	71,211	3	0.42	DUBLIN, REPUBLIC OF IRELAND
AKL	70,344	7	0.98	SYDNEY, N.S.W., AUSTRALIA
MEL	69,604	4	0.57	AUCKLAND, NEW ZEALAND
CHC	68,167	6	0.86	MELBOURNE, VICTORIA, AUSTRALIA
LGW	67,116	8	1.17	CHRISTCHURCH, NEW ZEALAND
YUL	65,366	8	1.19	LONDON-GATWICK, ENGLAND
ORF	64,753	7	1.07	MONTREAL, QUEBEC, CANADA
SMF	63,259	5	0.77	NORFOLK-VA. BEACH, VA, USA
STR	59,973	3	0.47	SACRAMENTO, CA, USA
PDX	55,447	7	1.17	STUTTGART, FRG
SVG	55,045	4	0.72	PORTLAND, OR, USA
LIH	54,320	3	0.55	STAVANGER, NORWAY
DEL	50,033	8	1.47	LIHUE, KAUAI, HA, USA
BOM	48,192	6	1.60	DELHI, INDIA
JNB	48,059	8	1.25	BOMBAY, INDIA
MAF	45,147	5	1.04	JOHANNESBURG, SOUTH AFRICA
YWG	44,751	3	0.66	MIDLAND ODESSA, TX, USA
ZRH	41,321	3	0.67	WINNIPEG, MAN, CANADA
CPH	41,237	4	0.97	ZURICH, SWITZERLAND
PLZ	40,727	4	0.97	COPENHAGEN, DENMARK
		7	1.72	PORT ELIZABETH, SOUTH AFRICA

TABLE 5.2 (CONTINUED) AIRPORT BIRD INGESTION RATES

(3 Or More Aircraft Ingestion Events)

Airport Code	Airport Operations	Ingestion Events	Ingestion Rate Events/10K Ops	Airport Location
BEG	38,517	3	0.78	BELGRADE, YUGOSLAVIA
LIS	38,228	3	0.78	LISBON, PORTUGAL
CCU	33,422	7	2.09	CALCUTTA, INDIA
ELS	31,567	5	1.58	EAST LONDON, SOUTH AFRICA
LIT	31,026	4	1.29	LITTLE ROCK, AK, USA
CPT	30,773	3	0.97	CAPE TOWN, SOUTH AFRICA
ITO	27,787	3	1.08	HILO HAWAII, HA, USA
HAI	27,370	4	1.46	HANOVER, FED REP OF GERMANY
BHM	26,708	4	1.50	BIRMINGHAM, AL, USA
LHE	25,548	7	2.74	LAHORE, PAKISTAN
ORY	25,127	5	1.99	PARIS - ORLY ARPT, FRANCE
KHI	25,124	4	1.59	KARACHI, PAKISTAN
DUR	24,288	6	2.47	DURBAN, SOUTH AFRICA
MAA	24,266	7	2.88	MADRAS, INDIA
MAN	24,179	5	2.07	MANCHESTER, ENGLAND (UK)
CGR	23,424	3	1.28	CAMPO GRANDE, BRAZIL
MAD	23,424	3	1.28	MADRID, SPAIN
BLR	23,250	8	3.44	BANGALORE, INDIA
LIN	22,833	3	1.31	MILAN Linate, ITALY
ISG	20,767	5	2.41	ISHIGAKI, JAPAN
TSV	19,626	4	2.04	TOWNSVILLE, QLD, AUSTRALIA
CBR	17,383	3	1.73	CANBERRA, A.C.T., AUSTRALIA
AMD	17,076	10	5.86	AHMEDABAD, INDIA
LST	16,128	3	1.86	LAUNCESTON, TASMANIA, AUSTRALIA
BRE	15,785	6	3.80	BREMEN, FED REP OF GERMANY
FNC	14,957	3	2.01	FUNCHAL - MADEIRA, PORTUGAL
NCE	14,532	9	6.19	NICE, FRANCE
COK	14,483	3	2.07	COCHIN, INDIA
BFN	14,158	7	4.94	BLOEMFONTEIN, SOUTH AFRICA
GOT	13,794	3	2.17	GOTHENBURG, SWEDEN
YXS	13,619	3	2.20	PRINCE GEORGE, BC, CANADA
PAT	13,223	8	6.05	PATNA, INDIA
LKO	12,896	5	3.88	LUCKNOW, INDIA
KIM	12,859	3	2.33	KIMBERLEY, SOUTH AFRICA
JAI	12,680	5	3.94	JAIPUR, INDIA
PMI	12,555	5	3.98	PALMA MALLORCA ISLAND, SPAIN
MMY	12,276	10	8.15	MIYAKO JIMA, JAPAN
NUE	11,527	3	2.60	NUREMBURG, FRG
BFS	11,351	5	4.40	BELFAST, N. IRELAND
EDI	10,151	5	4.93	EDINBURGH, SCOTLAND
YXJ	9,691	5	3.10	FT ST JOHN, BC, CANADA
BHX	8,690	4	4.60	BIRMINGHAM, ENGLAND (UK)
MDQ	8,442	3	3.55	MAR DEL PLATA, ARGENTINA
VNS	8,302	8	9.64	VARANASI, INDIA
PMR	8,038	3	3.73	PALMERSTON, NEW ZEALAND
TRV	7,796	7	8.98	TRIVANDRUM, INDIA
TUC	7,106	3	4.22	TUCUMAN, ARGENTINA
BHI	6,974	4	5.74	BAHIA BLANCA, ARGENTINA
SXR	6,850	3	4.38	SRINAGAR, INDIA
TNG	6,639	5	7.53	TANGIER, MOROCCO
HYD	6,582	8	12.15	HYDERABAD, INDIA
BBI	6,254	3	4.80	BHUBANESWAR, INDIA
WDH	5,792	3	5.18	WINDHOEK, NAMIBIA
AGR	5,670	4	7.05	AGRA, INDIA

TABLE 5.2 (CONCLUDED) AIRPORT BIRD INGESTION RATES

(3 Or More Aircraft Ingestion Events)				
Airport Code	Airport Operations	Ingestion Events	Ingestion Rate Events/10K Ops	Airport Location
NCL	5,293	3	5.67	NEWCASTLE, ENGLAND
CJB	4,662	4	8.58	COIMBATORE, INDIA
VCE	4,652	7	15.05	VALVERDE, CANARY ISLANDS
IXC	4,350	3	6.90	CHANDIGARH, INDIA
LCA	4,245	3	7.07	LARNACA, CYPRUS
FAO	4,081	4	9.80	FARO, PORTUGAL
ALC	3,014	4	13.27	ALICANTE, SPAIN
TFS	2,617	3	11.46	TENERIFFE-REINASOFIA, CANARY ISLAND
UTN	2,570	3	11.67	UPINGTON, SOUTH AFRICA
JRH	2,156	3	13.91	JORHAT, INDIA
LNZ	2,155	4	18.56	LONZ, AUSTRIA
RBA	1,093	3	(*)	RABAT, MOROCCO
LTN	1,018	7	(*)	LONDON-LUTON INT'L, ENGLAND
EMA	882	4	(*)	EAST MIDLANDS, ENGLAND
PIE	645	5	(*)	TAMPA-ST. PETERSBURG, FL, USA
IBZ	638	5	(*)	IBIZA, SPAIN
BRS	18	5	(*)	BRISTOL, ENGLAND (UK)
CAS	16	3	(*)	CASABLANCA, MOROCCO
LDE	8	6	(*)	LOURDES/TARBES, FRANCE
LOW	0	3	(**)	WIEN-SCHWEICHAU, OSTERREICH
LFB	0	3	(**)	BLAGNAC, FRANCE
LER	0	3	(**)	REUS, SPAIN
BNJ	0	3	(**)	BONN, FRG
	7,332,204	647	0.88 (***)	

(*) High proportion of unscheduled operations prevents calculation of meaningful ingestion rate.

(**) Undefined ingestion rate.

(***) Does not include airports whose rates are flagged with asterisks.

SECTION 6 ENGINE DAMAGE DESCRIPTION

The type of damage incurred by well-defined engine bird ingestion events is useful in refining bird certification test criteria that could lead to improved engine design. In general, three parameters are used to describe engine damage and failure. The first is the type of damage incurred, the second is whether or not the engine failed and the third is a description of the crew action taken during the engine ingestion event. The first part of this section provides descriptions of the types of damage incurred during the study, the relationships between engine damage and bird weight, engine damage and phase of flight, engine damage and aircraft airspeed, engine damage and multiple engine and multiple bird involvement, and the types of crew actions implemented as a result of the bird ingestion. The second part describes the statistical analysis of the relationship between bird weight and the likelihood of damage occurring in an engine ingestion event. The third part of this section provides estimates of the probabilities of a crew action or an engine shutdown. The fourth part describes the engine failures that were due to bird ingestions.

6.1 ENGINE DAMAGE AND CREW ACTION DESCRIPTIONS.

The types of damage that were identified in the data base were grouped into 14 categories which are defined in Table 6.1. Within the 3-year data collection period all 14 of the categories occurred. Tabulations of the occurrences of combinations of damage categories are presented in Table 6.2. The triangular top portion of the table provides tallies of co-occurrences for all pairs of damage categories. The number in the top portion represents the number of engine ingestion events in which both the row damage and the column damage occurred. The events in which more than two types of damage occurred were also included in the tallies of the top portion of Table 6.2. There were 39 events in which three types of damage occurred, 101 events in which two types of damage occurred and 314 events with a single type of damage.

There are insufficient data in the top portion of Table 6.2 to make any strong statements about correlations between types of damage. There is some indication that bent and dented fan blades accompany core damage and broken and shingled fan blades and that leading edge fan blade damage accompanies fan blade shingling; however, these trends cannot be strongly substantiated because of the small amount of data. The observed trends could provide the starting point for further investigations into the damage mechanisms of bird ingestions.

The bottom half of Table 6.2 provides tallies of the number of engine ingestion events in which each damage category was the only type of damage and the total number of events that involved each of the damage categories. Fewer than three bent and dented blades, shingled blades and nacelle and spinner damage seem more likely to occur by themselves than other types of damage. When more than three blades are bent or dented there is a much higher chance that some other type of damage will also occur. As with the trends identified in the top portion of Table 6.2, there is insufficient evidence to strongly substantiate these trends.

TABLE 6.1 DEFINITION OF ENGINE DAMAGE CATEGORIES

<u>DAMAGE CATEGORY</u>	<u>SEVERITY LEVEL</u>	<u>DAMAGE DEFINITION</u>
TRVSFRAC	Severe	Transverse fracture - fan blade broken chordwise (across) and piece liberated (includes secondary hard object damage).
CORE	Severe	Bent/broken compressor blades/vanes, blade/vane clash, blocked/disrupted airflow in low, intermediate, and high pressure compressors.
FLANGE	Severe	Flange separations.
TURBINE	Severe	Turbine damage.
BE/DE>3	Moderate	More than three fan blades bent or dented.
TORN>10	Moderate	More than ten torn fan blades.
BROKEN	Moderate	Broken fan blades, leading edge and/or tip pieces missing, other blades also dented.
SPINNER	Moderate	Dented, broken, or cracked spinner (includes spinner cap).
RELEASED	Moderate	Released (walked) fan blades (blade retention mechanism broken).
TORN<10	Mild	Ten or fewer torn fan blades.
SHINGLED	Mild	Shingled (twisted) fan blades.
NACELLE	Mild	Dents and/or punctures to the engine enclosure (includes cowl).
LEAD_EDG	Mild	Leading edge distortion/curl.
BEN/DEN	Mild	One to three fan blades bent or dented.

TABLE 6.2 TYPES OF DAMAGE CAUSED BY BIRD INGESTIONS

TRVSFRAC	CORE	FLANGE	TURBINE	BE/DE>3	TORN>10	BROKEN	SPINNER	RELEASED	TORN<10	SHINGLED	NACELLE	LEAD_EDG	BEN/DEN
11	CORE	0											
2	FLANGE	0											
0	TURBINE	0	2										
3	BE/DE>3	0	2	11									
2	TORN>10	0	0	0	1								
6	BROKEN	0	0	14	0								
0	SPINNER	0	0	0	0	0							
3	RELEASED	0	0	5	0	0							
0	TORN<10	0	0	1	0	1	0	0					
2	SHINGLED	0	0	19	0	6	0	5	1				
0	NACELLE	0	0	0	0	1	0	0	0	0			
0	LEAD_EDG	0	0	1	0	5	0	0	2	23	0		
6	BEN/DEN	0	0	0	0	16	0	2	0	25	2	6	
7	ONLY DAMAGE	12	0	38	0	30	1	0	1	89	5	31	99
29	TOTAL	48	2	80	2	70	1	11	6	159	7	64	151

Table 6.3 and 6.4 describe the relationship between the weight of the ingested bird and resulting engine damage. Table 6.3 shows the number of both multiple and single bird engine ingestion events as well as the total number of events with and without reported damage in each specified bird weight range where the bird was positively identified by an ornithologist. Engine damage summaries are shown in Tables 6.4A for all engine ingestion events, 6.4B for single bird events, and 6.4C for multiple bird events. These tables were made by tallying the damage codes from the events shown in Table 6.3 in each specified bird weight range.

Since many of the engine ingestion events have multiple damage categories, the total number of damage categories does not equal the number of engine ingestion events. Tables 6.4A, 6.4B, and 6.4C also show the damage sustained by those engines that were considered to have failed due to the bird ingestion. (See section 6.4 for more information on engine failure.)

The amount of data available is insufficient to draw any correlations between the weight of the ingested bird and the type of damage that occurs. However, Table 6.4A shows that 56 percent of the ingestions (111) in which the bird weighed less than or equal to 24 ounces caused no damage. In comparison only 17 percent of the birds ingested that weighed more than 24 ounces caused no engine damage.

The relationship between engine damage, phase of flight and aircraft airspeed is shown in Tables 6.5 and 6.6. Table 6.5 depicts the relationship between engine damage and phase of flight. Of the 1107 known phase of flight engine ingestion events, 61 percent occurred on takeoff and climb and 37 percent occurred during approach and landing. Forty-five percent of the engine ingestion events that took place during takeoff and climb resulted in engine damage; in comparison, only 24 percent resulted in damage during approach and landing. This suggests a relationship between engine speed (thrust) and bird ingestion engine damage, since engine speed would typically be higher during takeoff and climb than during approach and landing. However, engine speed or power was rarely reported during the study. It should be noted that 35 engine failures occurred during takeoff and climb and only 2 engine failures occurred during approach and landing.

Table 6.6 shows the number of engine ingestion events and the number of damaging engine ingestions known to have occurred below 140 knots airspeed and at or above 140 knots. The table also shows the phase of flight that these damaging engine ingestions occurred in those airspeed ranges. There were 13 percent (41 percent versus 28 percent respectively) more engine ingestions that resulted in engine damage at or above 140 knots airspeed than those that occurred below 140 knots. It is also shown that a significantly greater number of damaging ingestions occurred during takeoff and climb than during approach and landing at both aircraft airspeed ranges.

Multiple engine and multiple bird ingestion events present the greatest hazard to aircraft. Table 6.7 shows the number of these event that occurred. Fifty-eight aircraft had bird ingestions into both engines during the same event, and twelve events resulted in damage to both engines. There were also twenty-nine events where multiple birds were ingested into both engines;

TABLE 6.3. TALLY OF POSITIVELY IDENTIFIED BIRD SPECIES BY
WEIGHT RANGE AND EVENT TYPE

<u>Weight Range (oz.)</u>	Bird Identifications*		
	<u>Total Bird Events</u>	<u>Single Bird Events</u>	<u>Multiple Bird Events</u>
$0 < x \leq 8$	107	83	24
$8 < x \leq 16$	80	62	18
$16 < x \leq 24$	13	9	4
$24 < x \leq 32$	13	13	0
$32 < x \leq 40$	25	17	8
$x > 40$	15	13	2
Total	253	197	56

*One counted for each engine ingestion event

TABLE 6.4A. 737 AIRCRAFT ENGINE BIRD INGESTION DAMAGE SUMMARY
(TOTAL BIRD EVENTS)*

<u>Severity</u>	<u>Damage Category</u>	<u>Bird Weight Range (oz.)</u>					
		(0<x≤8)	(8<x≤16)	(16<x≤ 24)	(24<x≤32)	(32<x≤40)	(x>40)
	None	69	36	6	2	4	3
	Damage Unknown	4	5/1	0	1	0	0
	Other	0	3/1	0	1	6	0
Mild							
	Lead-Edg	3	6	2	1/1	3	0
	Shingled	10	11/2	1	1	6/1	4/1
	Ben/Den	18/1	10/1	3	1	3/1	3
	Torn<3	0	1	0	1	0	1
	Nacelle	1	0	0	2	0	0
Moderate							
	Be/De>3	6	8/3	2/2	0	6/3	5/1
	Torn>3	0	0	0	0	2/2	0
	Broken	7/1	6/2	2/1	5/1	3/2	3/1
	Spinner	0	0	0	0	0	0
	Released	0	4/3	0	0	1	1
Severe							
	Trvs Frac	4/4	8/8	1/1	2/2	3/3	1/1
	Core	3/2	9/7	2/2	2/1	1	5/1
	Flange	0	1/1	0	1/1	0	0
	Turbine	1/1	2/2	0	0	0	0

*Number of occurrences/number of occurrences when engine failed

TABLE 6.4B. 737 AIRCRAFT ENGINE BIRD INGESTION DAMAGE SUMMARY
(SINGLE BIRD EVENTS)*

<u>Severity</u>	<u>Damage Category</u>	<u>Bird Weight Range (oz.)</u>					
		(0<x≤8)	(8<x≤16)	(16<x≤24)	(24<x≤32)	(32<x≤40)	(x>40)
	None	56	31	3	2	2	3
	Damage Unknown	3	5/1	0	1	0	0
	Other	0	3/1	0	1	4	0
Mild							
	Lead-Edg	2	4	1	1/1	3	0
	Shingled	7	7/1	1	1	3	3/1
	Ben/Den	13	8/1	2	1	2/1	1
	Torn<3	0	1	0	1	0	1
	Nacelle	1	0	0	2	0	0
Moderate							
	Be/De>3	3	3/1	2/2	0	5/2	5/1
	Torn>3	0	0	0	0	2/2	0
	Broken	5	6/2	2/1	5/1	3/2	2/1
	Spinner	0	0	0	0	0	0
	Released	0	1/1	0	0	1	1
Severe							
	Trvs Frac	3/3	4/4	1/1	2/2	3/3	1/1
	Core	3/2	3/2	2/2	2/1	1	4/1
	Flange	0	1/1	0	1/1	0	0
	Turbine	1/1	0	0	0	0	0

*Number of occurrences/number of occurrences when engine failed

TABLE 6.4C. 737 AIRCRAFT ENGINE BIRD INGESTION DAMAGE SUMMARY
(MULTIPLE BIRD EVENTS)*

<u>Severity</u>	<u>Damage Category</u>	<u>Bird Weight Range (oz.)</u>					
		(0<x≤8)	(8<x≤16)	(16<x≤ 24)	(24<x≤32)	(32<x≤40)	(x>40)
	None	13	5	3	0	2	0
	Damage Unknown	1	0	0	0	0	0
	Other	0	0	0	0	2	0
Mild							
	Lead-Edg	1	2	1	0	0	0
	Shingled	3	4/1	0	0	3/1	1
	Ben/Den	5/1	2	1	0	1	2
	Torn<3	0	0	0	0	0	0
	Nacelle	0	0	0	0	0	0
Moderate							
	Be/De>3	3	5/2	0	0	1/1	0
	Torn>3	0	0	0	0	0	0
	Broken	2/1	0	0	0	0	1
	Spinner	0	0	0	0	0	0
	Released	0	3/2	0	0	0	0
Severe							
	Trvs Frac	1/1	4/4	0	0	0	0
	Core	0	6/5	0	0	0	1
	Flange	0	0	0	0	0	0
	Turbine	0	2/2	0	0	0	0

*Number of occurrences/number of occurrences when engine failed

TABLE 6.5. PHASE-OF-FLIGHT (POF) ANALYSIS

	Known POF Aircraft Events/ Engine Ingestions (1054/1107)	Known POF Damaging Aircraft Events/ Engine Ingestions (388/406)	Known POF Engine Failure Ingestions (37)
Takeoff and Climb	640/674	289/300	35
Approaching and Landing	387/406	89/96	2

TABLE 6.6. AIRCRAFT AIRSPEED ANALYSIS

Aircraft Airspeed	Known Speed Engine Ingestions (634)	Known Speed Engine Ingestions, Takeoff And Climb (387)	Known Speed Engine Ingestions, Landing And Approach (234)
< 140 Knots	412	215	190
≥ 140 Knots	222	172	44

Aircraft Airspeed	Known Speed Damaging Engine Ingestions (206)	Known Speed Damaging Engine Ingestions, Takeoff And Climb (159)	Known Speed Damaging Engine Ingestions, Landing And Approach (47)
< 140 Knots	116	78	38
≥ 140 Knots	90	81	9

TABLE 6.7. MULTIPLE ENGINE AND MULTIPLE BIRD ANALYSIS

	Aircraft Events/ Engine Ingestions	Damaging Engine Ingestions	Engine Failure Ingestions
Multiple Engine	58/116	38/12*	2
Multiple Bird	179/208	79	9
Single Bird	1237/1260	489	21

*Aircraft events where more than one engine damaged

potentially the most hazardous bird ingestion condition an aircraft can encounter.

Table 6.7 also gives the number of engine ingestion events where more than one bird was ingested into the engine. Of the 208 multiple bird engine ingestions that occurred, 38 percent of the ingestions resulted in some engine damage. In comparison 39 percent of the engines that ingested a single bird resulted in some engine damage. Four percent of the multiple bird ingestions resulted in engine failures compared to three percent for single bird ingestions.

There were four types of crew action identified in connection with the aircraft ingestion events in the data base. An air turnback was performed in 128 of the events, the takeoff was aborted 129 times, a diversionary maneuver was performed 16 times and in 21 events the crew action was listed as other without specifying the type of action taken. There was no crew action taken in 719 of the aircraft ingestion events for which a crew action entry was recorded, which is nearly 71 percent of the time. (One airplane crashed on takeoff.) The crew action should correspond to the phase of flight in which the event occurred. No change in the flight is usually required when an ingestion occurs during a landing maneuver. The aborted takeoffs and air turnbacks would most likely occur during takeoff and climb phases since there were practically no ingestions during the cruise phase. However, there were three air turnbacks as a result of a bird ingestion during the cruise phase.

6.2 PROBABILITY OF DAMAGE.

One of the key questions that inspired the bird ingestion survey is the issue of what weight bird should be considered for certification test criteria. Two of the main issues in deciding what the certification bird size should be are (1) the likelihood of ingesting a bird of the certification size or larger and (2) the likelihood that damage will result from ingesting a bird of a specified weight. The issue of bird weights is discussed in Sections 3 and 7 while the probability of damage is the topic of this section.

The problem of relating bird weight to the probability of damage (POD) is similar to bio-assay experiments which try to predict the probability of a response as a function of dose size. The key elements of similarity are that the probability of success for a dichotomous (pass/fail) trial is related to a continuous stimulus variable. In bird ingestions the dichotomous trial is whether or not damage occurs and the stimulus variable is the weight of the ingested bird.

Linear logistic analysis is the most commonly used method of analyzing the dosage-response type of data and has been used successfully in relating the probability of transparencies breaking as a function of projectile size in dealing with the problem of propwash blown gravel breaking helicopter windshields [10]. The logistic distribution function is assumed to describe the relationship between the probability of damage and the bird weight in a linear logistic analysis. The logistic distribution function is given by:

$$POD(w) = 1 / \{1 + \exp[-(\pi/\sqrt{3})(w - \mu)/\sigma]\} \quad (6.1)$$

where w is the bird weight, μ is the weight with a 50 percent chance of causing damage and σ is a parameter that is related to the steepness of the POD function.

The estimation of the function given in Equation 6.1 has been extensively studied and the methods have been described in the literature [11,12]. The method of maximum likelihood provides the best estimates for the type of data in the bird ingestion study since there are only a few ingestions at each weight. The software for estimating the parameters of Equation 6.1 has been developed and extensively tested at the UDRI [13] and verified by researchers at other institutions.

The types of damage were categorized as mild, moderate or severe by the FAA. Table 6.8 itemizes the types of damage that were included in each of the severity categories. Three distinct analyses were conducted based on the severity ratings. The three analyses estimated the probability of any damage, the probability of at least moderate damage and the probability of severe damage as a function of bird weight. Figures 6.1, 6.2, and 6.3 show the estimated POD functions along with confidence bounds on the POD functions for the three analyses. Note that the figures are based on the weight of one ingested bird per event, not the total weight of all birds ingested in the case of a multiple bird ingestion event.

Figure 6.1 shows the probability of any damage occurring and includes all three severity levels as positive responses. The probability of any damage occurring rises very steeply reaching 50 percent at about 10.0 ounces and the curve levels off at the 90 percent level at about 120 ounces. The relationship between bird weight and the probability of any damage is very strong and results in the confidence bound being close to the mean trend curve.

The probability of moderate damage does not rise quite so steeply and a definitive weight cutoff between birds that cause damage and those that do not cause damage cannot be identified. The probability of moderate damage reaches 50 percent at 66 ounces and remains below 70 percent through the weight range collected in this study. The confidence bound shown in Figure 6.2 is further from the mean trend than the confidence bound in Figure 6.1 because the trend in the probability of moderate damage as a function of bird weight is not as strong as the trend in the probability of any damage.

The probability of severe damage and its confidence bound are plotted in Figure 6.3 as functions of bird weight. The probability of severe damage is much lower than the probabilities of any damage or moderate damage. As a result, the curves are much flatter and rise much more slowly than the curves in Figures 6.1 and 6.2. The probability of severe damage remains below 35 percent through the weight range collected in this study.

The probability of damage analysis is clouded by the poor bird identification rates. The estimated POD functions are likely to be biased toward higher POD values since there was a larger proportion of birds identified when engine damage occurred. The extent of the bias cannot be estimated accurately.

TABLE 6.8 DAMAGE SEVERITY DEFINITIONS

SEVERITY LEVEL	DAMAGE DEFINITION
SEVERE DAMAGE	Damage classified as severe. Achieved when reported damage category is TRVSFRAC, CORE, FLANGE, or TURBINE.
MODERATE DAMAGE	Damage classified as moderate. Achieved when reported damage category is BE/DE>3, TORN>10, BROKEN, SPINNER, or RELEASED <u>AND</u> no SEVERE damage has been reported.
MILD DAMAGE	Damage classified as mild. Achieved when reported damage category is LEAD EDG, BEN/DEN, TORN<10, SHINGLED, or NACELLE <u>AND</u> neither SEVERE nor MODERATE damage has been reported.

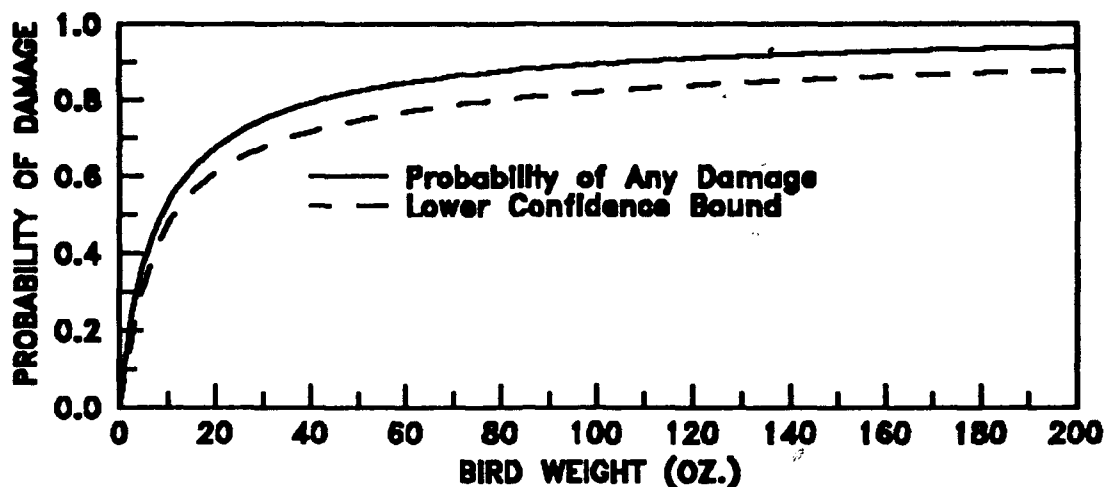


Figure 6.1. Estimated POD Function for Any Damage with the 95 Percent Confidence Bound.

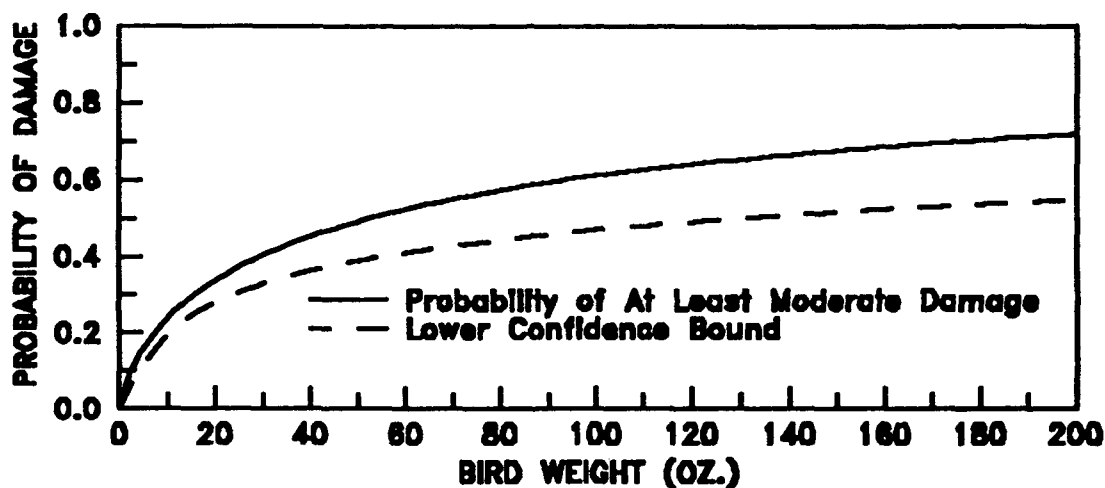


Figure 6.2. Estimated POD Function for Moderate or Worse Damage with the 95 Percent Confidence Bound.

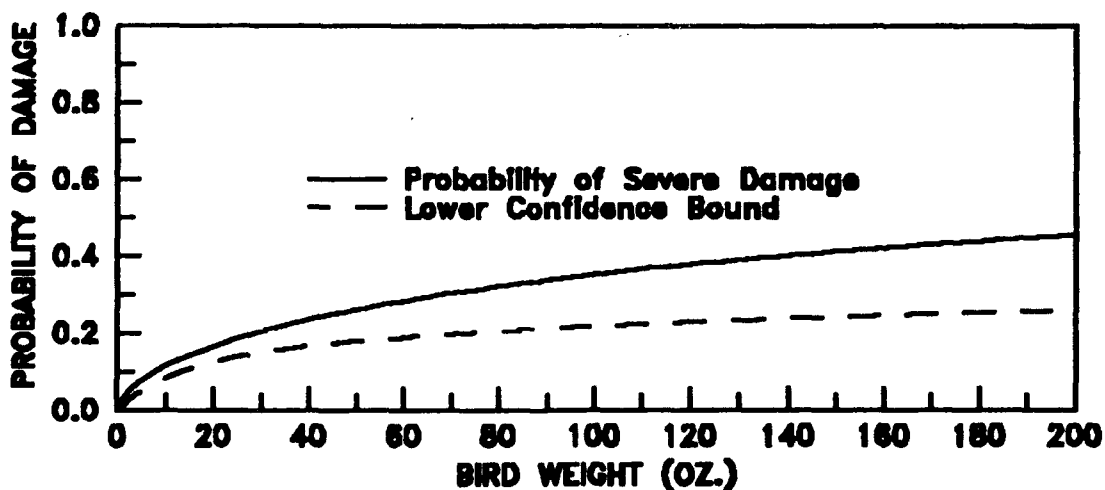


Figure 6.3. Estimated POD Function for Severe Damage with the 95 Percent Confidence Bound.

6.3 CREW ACTION AND ENGINE SHUTDOWN PROBABILITIES.

Two other factors that relate to the severity of engine damage are whether or not a crew action is required and whether or not an engine was shut down as a result of the ingestion. Table 6.9 lists the conditional probabilities that a crew action is required given the severity of damage that the engine incurs. The probability that a crew action is required increases with the severity of engine damage as expected. The third column of Table 6.9 contains the upper 95 percent confidence bound on the conditional probabilities given in column two.

The formulae for the estimates of the conditional probability of a crew action given the engine damage severity are:

$$\hat{P} = \frac{C}{N_s} \quad (6.2)$$

$$P_{CB} = \hat{P} + 1.645 \sqrt{\frac{\hat{P}(1-\hat{P})}{N_s}} \quad (6.3)$$

In Equations 6.2 and 6.3, \hat{P} is the estimated conditional probability of a crew action, C is the number of aircraft ingestion events in which a crew action was taken and an engine sustained the given severity level, N_s is the number of aircraft ingestion events in which an engine sustained the given severity level and P_{CB} is the upper confidence bound on the conditional probability. The constant 1.645 is derived from the cumulative normal distribution function to give a 95 percent level of confidence.

An in-flight engine shutdown occurred in 46 of the 1,410 aircraft ingestion events; which corresponds to an estimated probability of an in-flight engine shutdown given that an ingestion has occurred of 0.033 with a 95 percent confidence bound of 0.0404. The reason for the shutdown was not known in 25 of the events. An involuntary shutdown occurred seven times. Excessive vibration precipitated the shutdown nine times. The engine was shut down because of incorrect engine pressure ratio three times, incorrect engine parameter readings once, and high exhaust gas temperature twice. Inferences about the causes of in-flight shutdowns cannot be drawn because of the large proportion of shutdowns in which the cause was not identified.

6.4 ENGINE FAILURES.

Engine failures are important areas to consider when analyzing these engine bird ingestion events. For the purpose of this study an engine failure was considered to have occurred when an engine was not able to produce and maintain usable thrust of at least 50 percent for the use by the pilot of the aircraft. A transverse fan blade fracture and an involuntary engine in-flight shutdown were considered to be engine failures in all cases. Otherwise an engineering judgement was made based on the extent of engine damage, effect on flight, phase of flight, and any other factors that may have been provided in the description of the event or investigation summary.

TABLE 6.9

CONDITIONAL PROBABILITY OF CREW ACTION
GIVEN THE ENGINE DAMAGE SEVERITY

<u>ENGINE DAMAGE SEVERITY</u>	<u>PROBABILITY OF CREW ACTION P(CA)</u>	<u>UPPER CONFIDENCE BOUND</u>
NO DAMAGE	.139	.161
ANY DAMAGE	.289	.329
AT LEAST MODERATE DAMAGE	.400	.487
SEVERE DAMAGE	.567	.743

Table 6.10 provides a summary of some of the important data categories for the engine ingestion events that resulted in an engine failure. The conditional probability of an engine failure given that an ingestion has occurred is 0.029 with a lower 95 percent confidence bound of 0.021. The lower confidence bound was calculated using the Z statistic for proportions. The overall engine failure rate for the 737 aircraft due to bird ingestion was 0.005 failures per ten thousand aircraft operations.

Table 6.10 shows that a voluntary or involuntary in-flight shutdown of the engine occurred in 21 of the 42 engine failures. There was also a power loss associated with 89 percent of the engine failures where there was information reported in the power loss category. The most significant cause of engine failures appears to be transverse fan blade fracture which caused 27 of the 42 engine failures.

Reviewing the bird threat data for these engine failures shows that the species of bird was identified and an estimated weight was available in only 28 of the 42 engine failure events. The percentage of identifications is too low to allow statistical inferences about bird weights. The trend for the weights that are available is that the birds ingested in failure events are heavier than the birds ingested in all events. The mean of the weights for the birds that were identified in failure events is 27.5 ounces which is 10.3 ounces heavier than the overall mean. The higher mean for the failure events should be interpreted as a pointer to a possible trend that should be investigated further since the weight identifications are low.

Twenty-one of the engine failures were caused by the ingestion of a single bird and nine were caused by the ingestion of multiple birds. This is a much higher percentage than the fraction of all ingestion events which involved multiple birds. This suggests that engine failure is more likely in cases of multiple bird ingestion. Also, in 7 of the 28 engine failures where the bird weight was known, the bird or birds weighed more than 2 pounds. However, 16 were caused by birds that weighed less than or equal to 1 pound. Comparing this with the number of engine ingestions where the bird weight was known (Table 6.3), shows that 18 percent and 9 percent of the engine ingestion events resulted in engine failures when the bird weighed more than 2 pounds and less than or equal to 1 pound, respectively.

Almost all of the failure events occurred during takeoff (33) with two failures during the climb, one during the approach and one during landing. The phase of flight was unknown in five of the failure events. The engine location was split almost in half with 22 failures occurring in the left engine and 20 in the right.

TABLE 6.10. ENGINE FAILURE SUMMARY BY BIRD WEIGHT

<u>Bird (oz.) Weight</u>	<u>Number of Birds</u>	<u>Damage Code</u>	<u>Phase of Flight</u>	<u>Power Loss</u>	<u>In-Flight Shutdown</u>	<u>Crew Action</u>
1.5	1	A,O	Takeoff	Epr Dec	Vibes	ATB
4.0	--	A,I	---	---	---	--
4.0	--	A,I,K	Takeoff	Compressor	No	ATO
4.0	1	A,I,K	Takeoff	---	No	ATO
7.0	*	A,C,G,I	Takeoff	Compressor	Parameters	ATB
10.0	*	A,H,I,N	Takeoff	Compressor	Voluntary	ATB
10.1	*	A,I,K	Takeoff	Compressor	Vibes	ATB
11.5	6	A,D,K,O	Takeoff	Compressor	Involuntary	Crashed
11.5	8	A,D,K,O	Takeoff	Compressor	Involuntary	Crashed
12.0	1	A,I,M,P	Takeoff	Yes	Involuntary	ATB
14.0	1	A,G,I,K	Takeoff	Compressor	---	ATB
14.0	1	A,C,G,I	Takeoff	---	---	ATO
14.0	3	A,I,K,N	Takeoff	Compressor	Egt	ATB
15.0	1	A,D,H	Takeoff	Compressor	Involuntary	ATB
16.0	1	A,I,K,N	Takeoff	Compressor	Involuntary	ATB
16.0	*	A,I,K	Takeoff	Compressor	No	ATO
22.0	1	A,D,G,K	Takeoff	None	No	ATB
24.0	1	A,D,I,K	Takeoff	Compressor	Voluntary	ATB
28.0	1	A,B,G,K	Takeoff	Spool Down	Involuntary	ATB
28.0	1	A,I,M	Takeoff	---	No	ATO
32.0	1	A,I	Takeoff	Epr Dec	Yes	DIV
38.4	1	A,D,G	Takeoff	---	No	ATO
40.0	1	A,D,F,I	Climb	---	---	ATB

TABLE 6.10. ENGINE FAILURE SUMMARY BY BIRD WEIGHT (Continued)

40.0	2	A,D,H	Takeoff	Compressor	Yes	DIV
40.0	1	A,F,I	Takeoff	Compressor	Vibes	ATB
40.0	1	A,C,G,I	Takeoff	---	---	---
80.0	1	A,H,I	Takeoff	Compressor	Yes	ATB
192.0	1	A,D,G,K	Approach	Yes	Epr	---
---	--	A,C,G,I	---	---	---	None
---	---	A,Q	Climb	Spool Down	Involuntary	ATB
---	---	A,G,K	Takeoff	---	Vibes	ATO
---	1	A,I,K,Q	Takeoff	---	No	ATB
---	---	A,C,I,K	Takeoff	---	No	None
---	1	A,B,G,P	Takeoff	None	No	ATO
---	---	A,I	---	---	---	---
---	1	A,I	Takeoff	Yes	Yes	ATO
---	---	A,I	Takeoff	---	No	---
---	---	A,I	---	---	---	---
---	---	A,C,G,I	Landing	None	No	---
---	---	A,I	---	---	---	---
---	2	A,D	Takeoff	Compressor	No	ATO
---	---	A,D,G,K	Takeoff	Compressor	Yes	ATO

*Means more than one bird ingested but the exact count is unknown.

Note: A description of the columns and column contents can be found in Appendix B.

SECTION 7

PROBABILITY ESTIMATES

This section provides a summary of the probabilities of various bird ingestion events. The probability of an event is a measure of the likelihood that the event will occur. The probabilities in this section are calculated on a per operation basis and present similar information to the ingestion rates. The ingestion rates that were presented in Section 4 were calculated on the basis of 10,000 aircraft operations; however, it was shown in Section 4.2 that the per operation ingestion rate is equal to the probability of ingestion for a single operation. This section provides more details on the probabilities of various categories of bird ingestion events.

Table 7.1 provides the estimated probabilities and 95 percent confidence bounds for the whole B737 fleet for various aircraft ingestion events. The overall likelihood of an aircraft ingestion event in a single operation is slightly more than one in sixty-five hundred; and although the odds of having a bird ingestion on any one operation are very small, there are millions of B737 operations each year so that hundreds of ingestions are expected each year. Most ingestions occur during the takeoff and landing phases so that the probabilities for takeoff and climb and the approach and landing phases are relatively large. Dual engine and multiple bird ingestions are relatively rare (which is reflected in the smaller probabilities for these events).

The inlet area effect on aircraft ingestion probabilities is shown in Table 7.2 which separates the probabilities by location and engine. With the exception of single engine multiple bird ingestion events in the United States, the probabilities for the CFM International CFM56 are always larger than the corresponding probabilities for the Pratt and Whitney JT8D. The larger probabilities for the CFM56 are expected since the inlet area of the CFM56 is nearly twice the inlet area of the JT8D.

The probability of an ingestion that causes moderate or severe engine damage (POI_d) is calculated with respect to engine operations, not aircraft operations. Moderate or severe engine damage occurred in 180 (49 domestic, 130 foreign, 1 unknown) of the 1,468 engine ingestion events reported in the data collection period. The respective worldwide, domestic, and foreign POI_d values for the B737 fleet are 1.01×10^{-5} , 0.33×10^{-5} , and 1.59×10^{-5} . The respective worldwide, domestic, and foreign 95 percent confidence bounds on the POI_d values are 1.14×10^{-5} , 0.64×10^{-5} , and 1.84×10^{-5} .

The effect of bird weight on the probabilities is estimated in Tables 7.3 and 7.4. The entries in Tables 7.3 and 7.4 were calculated by multiplying the overall probability for each location/engine combination by the relative frequency of each bird weight range. The relative frequencies for bird weight ranges were derived from the weights of positively identified birds and are based on the number of events that involved birds in each weight range, not the total number of birds ingested. The validity of this calculation depends on the randomness of bird identifications, as discussed in Section 3. Table 7.3 provides a breakdown of the probability of ingestion (POI) by location and engine while Table 7.4 combines the two engine types. The calculations in Tables 7.3 and 7.4 were made on both an aircraft operation basis (Tables 7.3A and 7.4A) and an engine operation basis (Tables 7.3B and 7.4B). Tables 7.4A

and 7.4B show that the worldwide probability of ingesting one or more birds as a function of bird weight is 0.210×10^{-5} and 0.102×10^{-5} respectively at the 52-to 56-ounce weight range for the B737 aircraft fleet. Above this weight range the probability of ingestion decreases.

TABLE 7.1 AIRCRAFT OPERATION INGESTION PROBABILITIES

<u>CONDITION</u>	<u>INGESTION EVENTS</u>	<u>PROBABILITY* OF INGESTION</u>	<u>CONFIDENCE* BOUND</u>
All Flights	1,410	15.82	16.53
Takeoff & Climb [†]	863	9.68	10.24
Approach & Landing [†]	516	5.79	6.23
Dual Engine / Single Bird Per Engine	23	0.26	0.37
Dual Engine / Multiple Birds	35	0.39	0.52
Multiple Birds / Single Engine	144	1.62	1.86

* Scaled by 10^5

† Contains prorated apportionment of events with unknown phase of flight

TABLE 7.2 AIRCRAFT OPERATION INGESTION PROBABILITIES* BY LOCATION AND ENGINE TYPE
(BASED ON AIRCRAFT INGESTION EVENTS)

	JT8D ENGINE				CFM56 ENGINE			
	UNITED STATES	FOREIGN	WORLDWIDE	UNITED STATES	FOREIGN	WORLDWIDE	UNITED STATES	FOREIGN
Aircraft Operations:	3,250,832	3,145,832	6,396,263	1,578,741	935,849	2,514,590		
<hr/>								
Condition Under Consideration	Ing Evt Prob'lity	Ing Evt Prob'lity	Ing Evt Prob'lity	Ing Evt Prob'lity	Ing Evt Prob'lity	Ing Evt Prob'lity	Ing Evt Prob'lity	Ing Evt Prob'lity
All Flights	136	4.18	784	24.92	921 [†]	14.40	151	9.56
Takeoff And Climb Phases	107	3.29	492	15.64	600 [†]	9.38	92	5.83
Approach And Landing Phases	27	0.83	280	8.90	307	4.80	54	3.42
Dual Engine - Single Bird Events	2	0.06	10	0.32	12	0.19	4	0.25
Multiple Birds - ^{††} Single Engine Events	12	0.37	71	2.26	83	1.30	4	0.25
Multiple Birds - ^{†††} Dual Engine Events	4	0.12	15	0.48	19	0.30	2	0.13
							10	1.07
							12	0.48

* Ingestion probabilities scaled by 10⁵

[†]Geographic region unknown for 1 takeoff event

^{††}Engine type unknown for 13 events

^{†††}Engine type unknown for 4 events

TABLE 7.3A
PROBABILITY OF INGESTION* AS A FUNCTION OF BIRD WEIGHT BY LOCATION AND ENGINE TYPE
(BASED ON AIRCRAFT OPERATIONS)

Bird Wt Range (Oz.)	JT8D ENGINE			CFM56 ENGINE		
	US	FOREIGN	WORLDWIDE	US	FOREIGN	WORLDWIDE
Aircraft Ops:	3,250,431	3,145,832	6,396,263	1,578,741	935,849	2,514,590
Bird Wt Range (Oz.)	Prob. of Ingestion	Prob. of Ingestion	Prob. of Ingestion	Prob. of Ingestion	Prob. of Ingestion	Prob. of Ingestion
	Prob. of Ingestion	Prob. of Ingestion	Prob. of Ingestion	Prob. of Ingestion	Prob. of Ingestion	Prob. of Ingestion
(0 < X ≤ 4)	1.778	3.887	3.286	3.454	4.369	4.256
(4 < X ≤ 8)	0.628	6.859	3.479	0.266	6.553	2.240
(8 < X ≤ 12)	---	3.658	1.546	0.266	10.922	3.584
(12 < X ≤ 16)	0.732	2.515	1.739	2.923	3.641	3.584
(16 < X ≤ 20)	0.209	0.686	0.483	---	2.912	0.896
(20 < X ≤ 24)	0.105	0.457	0.290	0.266	---	0.224
(24 < X ≤ 28)	0.105	0.915	0.483	0.266	0.728	0.448
(28 < X ≤ 32)	---	1.372	0.580	---	---	---
(32 < X ≤ 36)	---	---	---	0.531	1.456	0.896
(36 < X ≤ 40)	0.313	2.286	1.256	1.328	---	1.120
(40 < X ≤ 44)	---	---	---	0.266	---	0.224
(44 < X ≤ 48)	---	0.686	0.290	---	0.728	0.224
(52 < X ≤ 56)	0.209	0.229	0.290	---	---	---
(56 < X ≤ 60)	---	0.229	0.097	---	---	---
(76 < X ≤ 80)	---	0.229	0.097	---	---	---
(84 < X ≤ 88)	---	0.457	0.193	---	---	---
(124 < X ≤ 128)	0.105	---	0.097	---	---	---
(188 < X ≤ 192)	---	0.457	0.193	---	---	---
All Weights†	4.184	24.992	14.399	9.565	31.308	17.697

* Probability that either engine will ingest 1 or more birds of a given weight class per aircraft operation. Probabilities have been scaled up by 10⁵.

† Cumulative probability of all weight bands. Also probability of ingestion for engine, location combination.

TABLE 7.3B
PROBABILITY OF INGESTION* AS A FUNCTION OF BIRD WEIGHT BY LOCATION AND ENGINE TYPE
(BASED ON ENGINE OPERATIONS)

Engine Ops:	Bird Wt Range (Oz.)	JT8D ENGINE			CFM56 ENGINE		
		US	FOREIGN	WORLDWIDE	US	FOREIGN	WORLDWIDE
		6,500,862	6,291,664	12,792,526	3,157,482	1,871,698	5,029,180
Bird Wt Range (Oz.)		Prob. of Ingestion			Prob. of Ingestion		
		US	FOREIGN	WORLDWIDE	US	FOREIGN	WORLDWIDE
(0 < X ≤ 4)		0.884	2.000	1.652	1.963	2.114	2.299
(4 < X ≤ 8)		0.312	3.556	1.794	0.131	3.172	1.095
(8 < X ≤ 12)		---	2.111	0.897	0.131	6.343	2.080
(12 < X ≤ 16)		0.468	1.222	0.944	1.439	2.114	1.861
(16 < X ≤ 20)		0.104	0.333	0.236	---	1.410	0.438
(20 < X ≤ 24)		0.052	0.222	0.142	0.131	---	0.109
(24 < X ≤ 28)		0.052	0.444	0.236	0.131	0.352	0.219
(28 < X ≤ 32)		---	0.667	0.283	---	---	---
(32 < X ≤ 36)		---	---	---	0.262	0.705	0.438
(36 < X ≤ 40)		0.156	1.222	0.661	0.654	---	0.547
(40 < X ≤ 44)		---	---	---	0.131	---	0.109
(44 < X ≤ 48)		---	0.333	0.142	---	0.352	0.109
(52 < X ≤ 56)		0.104	0.111	0.142	---	---	---
(56 < X ≤ 60)		---	0.111	0.047	---	---	---
(76 < X ≤ 80)		---	0.111	0.047	---	---	---
(84 < X ≤ 88)		---	0.222	0.094	---	---	---
(124 < X ≤ 128)		0.052	---	0.047	---	---	---
(188 < X ≤ 192)		---	0.222	0.094	---	---	---
All Weights†		2.184	12.890	7.457	4.972	16.563	9.306

* Probability that an engine will ingest 1 or more birds of a given weight class per engine operation. Probabilities have been scaled up by 10⁵.

† Cumulative probability of all weight bands. Also probability of ingestion for engine, location combination.

TABLE 7.4A
PROBABILITY OF INGESTION* AS A FUNCTION OF BIRD WEIGHT BY LOCATION
(BASED ON AIRCRAFT OPERATIONS)

BOEING-737 COMMERCIAL FLEET			
	UNITED STATES	FOREIGN	WORLDWIDE
Aircraft Operations:	4,829,172	4,081,681	8,910,853
Bird Weight Range (Ounces)	Probability Of Ingestion	Probability Of Ingestion	Probability Of Ingestion
(0 < X ≤ 4)	2.351	4.215	3.672
(4 < X ≤ 8)	0.531	7.025	3.138
(8 < X ≤ 12)	0.076	5.445	2.136
(12 < X ≤ 16)	1.669	2.810	2.537
(16 < X ≤ 20)	0.152	1.229	0.601
(20 < X ≤ 24)	0.152	0.351	0.267
(24 < X ≤ 28)	0.152	0.878	0.467
(28 < X ≤ 32)	---	1.054	0.401
(32 < X ≤ 36)	0.152	0.351	0.267
(36 < X ≤ 40)	0.758	1.756	1.335
(40 < X ≤ 44)	0.076	---	0.067
(44 < X ≤ 48)	---	0.703	0.267
(52 < X ≤ 56)	0.152	0.176	0.200
(56 < X ≤ 60)	---	0.176	0.067
(76 < X ≤ 80)	---	0.176	0.067
(84 < X ≤ 88)	---	0.351	0.134
(124 < X ≤ 128)	0.076	---	0.067
(188 < X ≤ 192)	---	0.351	0.134
All weights†	6.295	27.048	15.823

* Probability that either engine will ingest 1 or more birds of a given weight class per aircraft operation. Probabilities have been scaled up by 10^5 .

† Cumulative probability of all weight bands in geographic location.

TABLE 7.4B
PROBABILITY OF INGESTION* AS A FUNCTION OF BIRD WEIGHT BY LOCATION
(BASED ON ENGINE OPERATIONS)

BOEING-737 COMMERCIAL FLEET			
	UNITED STATES	FOREIGN	WORLDWIDE
Engine Operations:	9,658,344	8,163,362	17,821,706
Bird Weight Range (Ounces)	Probability Of Ingestion	Probability Of Ingestion	Probability Of Ingestion
(0 < X ≤ 4)	1.231	2.133	1.888
(4 < X ≤ 8)	0.261	3.583	1.595
(8 < X ≤ 12)	0.037	3.156	1.237
(12 < X ≤ 16)	0.932	1.450	1.367
(16 < X ≤ 20)	0.075	0.597	0.293
(20 < X ≤ 24)	0.075	0.171	0.130
(24 < X ≤ 28)	0.075	0.427	0.228
(28 < X ≤ 32)	---	0.512	0.195
(32 < X ≤ 36)	0.075	0.171	0.130
(36 < X ≤ 40)	0.373	0.938	0.684
(40 < X ≤ 44)	0.038	---	0.033
(44 < X ≤ 48)	---	0.341	0.130
(52 < X ≤ 56)	0.075	0.085	0.098
(56 < X ≤ 60)	---	0.085	0.033
(76 < X ≤ 80)	---	0.085	0.033
(84 < X ≤ 88)	---	0.171	0.065
(124 < X ≤ 128)	0.038	---	0.033
(188 < X ≤ 192)	---	0.171	0.065
All Weights†	3.282	14.075	8.237

* Probability that an engine will ingest 1 or more birds of a given weight class per engine operation. Probabilities have been scaled up by 10^5 .

† Cumulative probability of all weight bands in geographic location.

SECTION 8 DATA QUALITY

The interpretations derived from any large set of data are only as good as the data. The use of poor data can lead to invalid and misleading conclusions. The conclusions reached in this report should be interpreted in the context of the sources of the data and the quality of the data. The following paragraphs discuss the sources of data for the 3 years and the quality of the data as measured by the consistency of the data collected in each of the 3 years and by the consistency of the ICAO data with the data collected by the FAA.

8.1 DATA SOURCES.

The main body of data was collected by the manufacturers of the two engines used on B737 aircraft under separate contracts with the FAA. The FAA also collected data from the FAA Voluntary Bird Strike/Incident Report (FAA Form 5200-7) and from reports received from FAA field inspectors (see FAA Action Notice A8300.39). A second source of data used in this report is an ongoing effort by the ICAO to collect aviation bird strike data. A significant number of B737 bird ingestion events were recorded by the ICAO that were not collected through FAA sources. The additional events were included with the FAA data base for the preparation of this second report.

The engine manufacturers, FAA, and ICAO conducted a census rather than a survey, i.e., the goal of both studies was to collect information on every B737 bird ingestion event in the 3-year period. A complete census is nearly impossible to achieve under any circumstances; therefore, estimates involving the total number of ingestions, such as ingestion rates, should be viewed as lower bounds.

8.2 INTERNAL CONSISTENCY.

The data collected over the third year of the program appear to be consistent with the data collected in the first 2 years. Most of the tables, graphs and statistical tests presented in this report for the 3-year period are very similar to the corresponding data presented in earlier reports [1,2] for the data collected in the first 2 years. This section provides statistical verification of the similarities and discusses some of the differences.

The first feature for comparing the 3 years is the total number of aircraft ingestion events collected in each year. Section 4 provided evidence that aircraft ingestion events occur according to a Poisson process so that the proportion of events that were recorded in each year should be equal to the proportion of operations conducted in that year.

The same formulas used in Section 4 can be used here except that the area factor is no longer required since comparisons are made between years for the same engine. The formula for the expected proportion of events in year i becomes:

$$P_i = O_i / (O_1 + O_2 + O_3) \quad (8.1)$$

where O_i ($i=1,3$) represents the number of operations for the specific engine and geographic location for year i .

The Chi-squared goodness-of-fit test is used instead of a Z test since there are more than two years. The Chi-squared test statistic provides a measure of the closeness of the observed number of events in each year to the number that would be expected if the collection rates were the same in each year. The expected number of events in year i are given by:

$$E_i = P_i * N \quad (8.2)$$

where N is the total number of events for the 3 years. The test statistic is then given by:

$$\chi^2 = \sum_{i=1}^3 \frac{(X_i - E_i)^2}{E_i} \quad (8.3)$$

where X_i is the observed number of events in year i .

The data for performing the test are presented in Table 8.1 and Table 8.2. The number of events and number of operations for each year are broken down by engine type and geographic location in Table 8.1. The calculated χ^2 values for the test are given in Table 8.2 for each engine and location combination. The Chi-squared test detects any type of change among the 3 years and the critical value for a five percent level of significance for a Chi-square with two degrees of freedom is 5.99. The only significant change is in the collection rate for the foreign JT8D data.

The large value of the test statistic for foreign JT8D ingestion rates is caused by a large number of ingestion events reported in the second year.

The change in collection rates for the JT8D could affect the test for size effect that was described in Section 4. In the first year report [1] both area and diameter provided adequate adjustments for the differences in ingestion rates between the two engines. In the 2-year report [2], area provided an adequate adjustment but diameter did not; while in the 3-year report diameter provided an adequate adjustment but area did not. The high second year collection rate would have an impact on the ingestion rate analysis so that investigations into the nature of engine size effects should be considered inconclusive.

Another check on the consistency of the data collection is to compare the birds that were identified in the 3 years. There were too many different species and locations of ingestions to allow comparisons of these features; however, if the species identifications are reduced to bird weights the cumulative weight distributions for the 3 years can be compared.

Table 8.3 provides a table of the cumulative weight distributions for each of the 3 years for birds ingested in the United States and for birds ingested in foreign countries. The data in Table 8.3 are plotted in Figures 8.1 and 8.2 to provide visual comparisons of the three yearly bird weight distributions for United States and foreign ingested birds. The distributions for the United States ingestions are moderately close, and the distributions for the foreign ingestions are very close.

TABLE 8.1
COUNTS FOR UNITED STATES AND FOREIGN
AIRCRAFT EVENTS AND AIRCRAFT OPERATIONS BY YEAR AND ENGINE

	<u>JT8D</u>		<u>CFM56</u>	
	EVENTS	OPERATIONS	EVENTS	OPERATIONS
<u>YEAR 1</u>				
UNITED STATES	40	1,160,091	40	353,656
FOREIGN	238	1,057,633	63	174,206
<u>YEAR 2</u>				
UNITED STATES	49	1,082,543	46	527,431
FOREIGN	314	1,062,971	88	302,415
<u>YEAR 3</u>				
UNITED STATES	47	1,007,797	65	697,654
FOREIGN	232	1,025,228	142	459,228

TABLE 8.2
CHI-SQUARED TEST STATISTICS
FOR COMPARING ANNUAL INGESTION RATES

	UNITED STATES	FOREIGN
JT8D	2.36	13.74
CFM56	1.56	1.81

TABLE 8.3

COMPARISON OF WEIGHT DISTRIBUTIONS BETWEEN
BIRDS INGESTED IN THE FIRST, SECOND, AND THIRD YEARS

WEIGHT (OZ)	<u>CUMULATIVE PROBABILITY</u>					
	<u>UNITED STATES</u>			<u>FOREIGN</u>		
	YEAR 1	YEAR 2	YEAR 3	YEAR 1	YEAR 2	YEAR 3
4	26.3	50.0	37.0	28.6	14.3	11.4
8	42.1	61.1	41.3	53.6	39.3	38.6
12	47.4	61.1	41.3	67.9	58.9	61.4
16	63.2	77.7	76.1	82.1	64.3	74.3
20	68.4	77.8	78.3	82.1	71.4	78.6
24	68.4	83.3	80.4	89.3	71.4	78.6
28	68.4	88.9	82.6	89.3	73.2	84.3
32	68.4	88.9	82.6	92.9	78.6	87.1
36	68.4	94.4	84.8	92.9	80.4	88.6
40	84.2	100.0	97.8	96.4	89.3	94.3
44	84.2	100.0	100.0	96.4	89.3	94.3
48	84.2	100.0	100.0	100.0	91.1	97.1
56	94.7	100.0	100.0	100.0	92.9	97.1
60	94.7	100.0	100.0	100.0	94.6	97.1
80	94.7	100.0	100.0	100.0	96.4	97.1
88	94.7	100.0	100.0	100.0	98.2	98.6
128	100.0	100.0	100.0	100.0	98.2	98.6
192	100.0	100.0	100.0	100.0	100.0	100.0

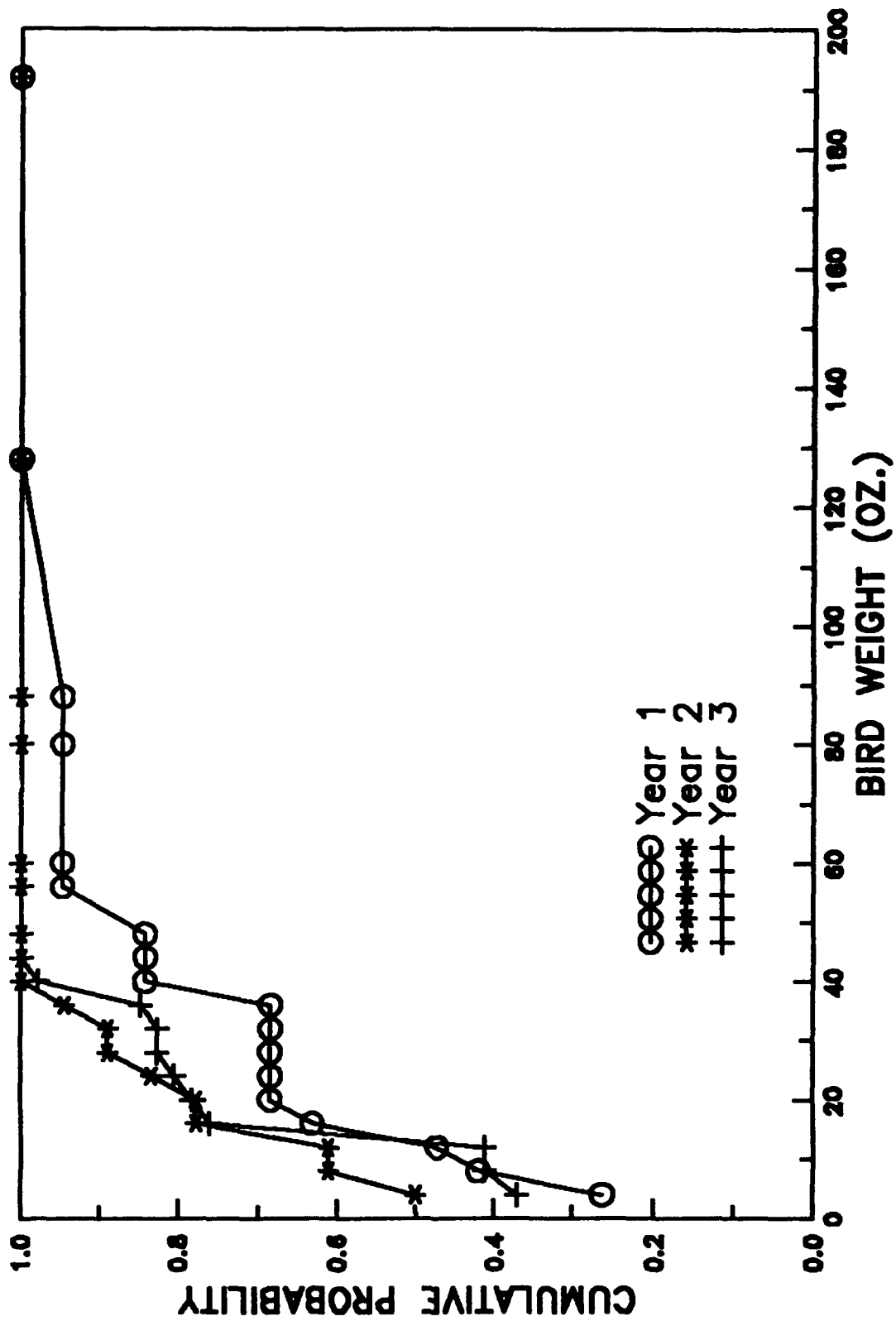


Figure 8.1. Comparison of the United States Bird Weight Distributions for the First, Second, and Third Years.

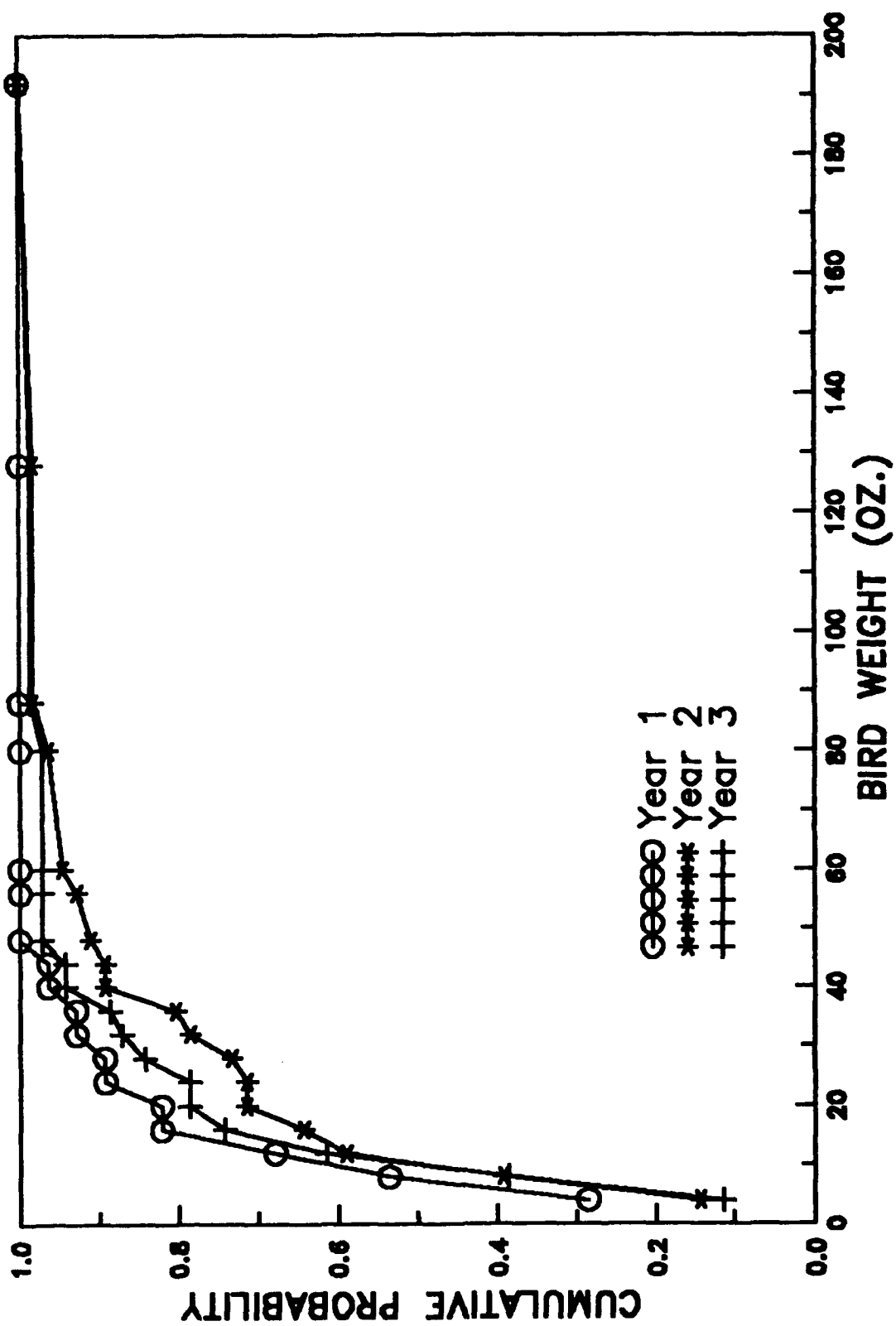


Figure 8.2. Comparison of the Foreign Bird Weight Distributions for the First, Second, and Third Years.

A statistical measure of the closeness of the cumulative distributions plotted in Figures 8.1 and 8.2 is provided by a multi-sample extension of the Kolmogorov-Smirnov D test, described by Kiefer [14]. The D statistic is the maximum vertical distance between two observed cumulative distribution functions while the T statistic described by Kiefer is the maximum vertical scatter among the three observed cumulative distribution functions. The formula for the T statistic is:

$$T = \max_x \sum_{j=1}^3 n_j [S_j(x) - \bar{S}(x)]^2, \quad (8.4)$$

where \max_x indicates the maximum over x , n_j is the sample size in year j , $S_j(x)$ is the observed cumulative distribution function in year j and $\bar{S}(x)$ is the observed cumulative distribution function for all 3 years combined.

The Kiefer goodness-of-fit test shows very good consistency between the 3 years for the ingested bird weight distribution. The T statistic for the U. S. bird ingestions is 0.82 and for the foreign bird ingestions is 0.63 which are the twenty-seventh and twelfth percentiles of the null distribution of T. Large values of T indicate differences between the three distributions and the observed values given above are in the lower half of the likely range of T. There is no statistical evidence that the bird weight distributions have changed over the 3-year period.

The ICAO data seem to be consistent with the data collected by the FAA. The only substantial change from including the ICAO data is an increase in the estimated ingestion rates and probabilities. This is the result of an additional 392 aircraft ingestion events that were reported by the ICAO. Most of the additional events occurred during foreign operations.

If the ICAO data were inconsistent with the FAA data, some of the statistical tests would have shown different conclusions with the combined set of data. None of the conclusions in the report changed when the ICAO data were combined with the FAA data. Specific values of test statistics are different; however, the conclusions remained the same. The ICAO data seem to support the patterns in B737 bird ingestion events that are evident in the FAA data.

The overall quality of the data used in the report seems to be adequate. There is reasonable consistency from year to year with a slightly higher collection rate in the second year. The two sources of data show good compatibility so that there should be no bias due to different collection procedures. The data used in this report should provide valuable information about the bird ingestion hazard.

SECTION 9 CONCLUSIONS

This section summarizes conclusions based on the 3 years of data for the B737 aircraft.

Bird Descriptions

Gulls, doves, and lapwings are most often ingested.

There is a better species identification rate when the engine is damaged.

The weight of a bird most likely to be ingested outside the United States is significantly heavier than one most likely to ingested within the United States.

Ingestion Rates

Bird ingestion events are seasonal with the highest rates in the summer and the lowest in the winter.

Bird ingestion events are much more likely to occur during daylight than at night.

Bird ingestion events can be modeled as a Poisson process.

Bird ingestion rates are proportional to the inlet size of the engine.

Airport Experiences

The foreign bird ingestion rate is significantly higher than the United States ingestion rate.

Effect of Flight

The probability that a crew action is required increases with the severity of engine damage.

The effects of flight that occur most often are air turnbacks and aborted takeoffs.

The probability of experiencing an involuntary in-flight engine shutdown, given a bird ingestion has occurred, is approximately one-half of one percent.

Engine Damage

Some types of engine damage are correlated with other types of damage.

The majority of engine bird ingestion events result in either minor or no engine damage.

The probability of any damage increases with the weight of the bird ingested.

The probability of engine damage, given a bird ingestion has occurred, is greater when the ingestion occurs during the takeoff and climb phases of flight than those that occur during approach and landing.

The probability of engine damage, given a bird ingestion has occurred, is greater when the aircraft airspeed is greater than or equal to 140 knots than those that occur at less than 140 knots.

Engine failure appears more likely to occur when multiple birds are ingested.

The mean or average weight of the birds that caused engine failures was significantly heavier than the mean weight for all bird ingestion events.

Engine failure is not necessarily associated exclusively with severe engine damage.

Engine failure appears more likely to occur during the takeoff phase of flight.

Engine failure can be caused by a bird ingestion in any bird weight range.

The majority of engine failures are caused by transverse fan blade fractures.

The probability of experiencing an engine failure, given a bird ingestion has occurred, is approximately 3 percent.

Probabilities of Ingestion

Bird ingestions are more likely during the takeoff and landing phases of an aircraft operation.

The worldwide probability of a bird ingestion as a function of bird weight for the B737 fleet remains relatively high up to 56 ounces.

Data Quality

The overall quality of the bird ingestion data collected by the engine manufacturers for the FAA is adequate for a meaningful statistical analysis.

SECTION 10
REFERENCES

1. Hovey, P., Skinn, D., and Wilson, J., "Study of the Engine Bird Ingestion Experience of the Boeing-737 Aircraft (October 1986 - September 1989)," DOT/FAA/CT-90/28, Department of Transportation, Federal Aviation Administration, December 1991.
2. Hovey, P. and Skinn, D., "A Study of the Engine Bird Ingestion Experience of the Boeing-737 Aircraft," DOT/FAA/CT-89/16, Department of Transportation, Federal Aviation Administration, October 1989.
3. Hovey, P., Skinn, D., and Wilson, J., "Study of the Engine Bird Ingestion Experience of the Boeing-737 Aircraft (October 1986 - September 1988)," DOT/FAA/CT-89/29, Department of Transportation, Federal Aviation Administration, May 1990.
4. Frings, G., "A Study of Bird Ingestions into Large High Bypass Ratio Turbine Aircraft Engines," DOT/FAA/CT-84/13, Department of Transportation, Federal Aviation Administration, September 1984.
5. Martino, J. P. and Skinn, Donald A., "Study of Bird Ingestion into Small Inlet Area, Aircraft Turbine Engines (May 1987 through April 1988)," DOT/FAA/CT-89/17, Department of Transportation, Federal Aviation Administration, December 1989.
6. Martino, J. P., Skinn, Donald A., and Wilson, J. J., "Study of Bird Ingestion into Small Inlet Area, Aircraft Turbine Engines (May 1987 through April 1989)," DOT/FAA/CT-90/13, Department of Transportation, Federal Aviation Administration, October 1990.
7. Berens, A.P., West, B.W., and Turella, M.A., "On a Probabilistic Model for Evaluating the Birdstrike Threat to Aircraft Crew Enclosures," UDR-TR-78-124, University of Dayton Research Institute, Dayton, OH, November 1978.
8. Skinn, D.A. and Berens, A.P., "Bird Avoidance Model (BAM) Phase I Report: Feasibility Demonstration," UDR-TR-80-122, University of Dayton Research Institute, Dayton, OH, November 1980.
9. Liliefors, H.J., "On the Kilmogorov-Smirnov Test for the Exponential Distribution with Mean Unknown," Journal of the American Statistical Assoc., Vol. 64, March 1969, pp. 387-389.
10. Bertke, R.S. and Hovey, P.W., "Glass/Acrylic Coupon Impact Testing," UDR-TR-82-145, University of Dayton Research Institute, Dayton, OH, November 1982.
11. Cox, D.R., "The Analysis of Binary Data," Department of Mathematics Imperial College, Methuen & Co., Ltd., London, England, 1970.
12. Fienberg, S.E., "The Analysis of Cross-Classified Categorical Data," ISBN 0-262-06063-9, MIT Press, 1977.

13. Berens, A.P., Hovey, P.W., Donahue, R.M., and Craport, W.M., "User's Manual for Probability of Detection Software System (POD/SS)," UDR-TR-88-12, University of Dayton Research Institute, Dayton, OH, January 1988.
14. Kiefer, J. "K-Sample Analogues of the Kolmogorov-Smirnov and Cramer-von Mises Tests," Annals of Mathematical Statistics, Vol. 30, 1959, pp. 420-447.

SECTION 11
GLOSSARY

<u>Term</u>	<u>Definition of Term</u>
Aircraft Ingestion Event	Simultaneous ingestion of one or more birds into one or more engines of an aircraft.
Aircraft Operation	A nonstop aircraft flight from one airport to another. (Includes time from taxi-out from departure airport through taxi-in at arrival airport.)
Airport Operation	Takeoff (departure) from an airport or a landing (arrival) at an airport.
Engine Ingestion Event	Process whereby one or more birds pass through the engine inlet during engine operation.
Engine Operation	The participation of each engine of an aircraft in an aircraft operation (e.g., a twin engine aircraft would, ideally, experience two engine operations for each aircraft operation).
Ingested Bird	A bird having experienced the process of engine ingestion event.
Ingestion Rate	The number of aircraft or engine ingestion events per flight event. Flight event refers to aircraft, engine or airport operation. The components of ingestion rate are specified when used in the report. The influence of engine inlet area is not considered.
Normalized Ingestion Rate	Ingestion rate adjusted to a given nominal area. Allows statistical comparison of ingestion rates of engines with different inlet areas.

APPENDIX A

AIRPORTS WITH SCHEDULED BOEING-737 FLIGHTS AND/OR REPORTED BIRD INGESTION EVENTS

This appendix presents information about airports having scheduled Official Airline Guide (OAG) operations or aircraft ingestion events during the 3-year data collection period. The data are taken from a data base developed by the contractor. The data base contents are described below:

<u>COLUMN</u>	DESCRIPTION OF COLUMN CONTENTS
AIRPORT	Airport code. 3-letter ATA code 4-letter ICAO code
APTDEF	Location of airport.
HEMISPHER	Hemisphere in which AIRPORT is located. N - Northern Hemisphere S - Southern Hemisphere
CONUS	Indicates whether AIRPORT is located in the United States. YES - located in contiguous United States (48 states) NO - not located in the contiguous United States, but in the United States (Alaska or Hawaii) FGN - foreign airport
STGFY87	Scheduled OAG airport operations during first year.
ING1	Aircraft ingestion events during first year.
STGFY88	Scheduled OAG airport operations during second year.
ING2	Aircraft ingestion events during second year.
STGFY89	Scheduled OAG airport operations during third year.
ING3	Aircraft ingestion events during third year.
STG737	Scheduled OAG airport operations during 3-year period.
INGS	Aircraft ingestion events during 3-year period.

AIRPORT	APTDEF	HEMISPHR	CONUS	STGFY87	ING1	STGFY88	ING2	STGFY89	ING3	STG737	INGS
AAE	ANNABA, ALGERIA	N	FGN	2393	0	2237	0	2061	0	6691	0
AAY	AL GHAYDAH, YEMEN	N	FGN	210	0	314	0	162	0	686	0
ABE	ALLENTOWN, PA, USA	N	YES	370	0	1573	0	2490	0	4433	0
ABJ	ABIDJAN, COTE D'IVOIRE (IVORY COAST)	N	FGN	1620	0	1806	0	1899	0	5325	0
ABQ	ALBUQUERQUE, NM, USA	N	YES	41942	0	43562	0	44079	1	129583	1
ABS	ABU SIMBEL, ARAB REP OF EGYPT	N	FGN	3366	0	5028	0	5496	0	13890	0
ABT	AL BAH, SAUDI ARABIA	N	FGN	1148	0	642	0	626	0	2416	0
ABV	ABUJA, NIGERIA	N	FGN	1240	0	1178	0	1160	0	3578	0
ABZ	ABERDEEN, SCOTLAND	N	FGN	1519	0	1636	0	2871	0	6026	0
ACA	ACAPULCO, MEXICO	N	FGN	126	0	322	1	120	0	568	1
ACC	ACCRA, GHANA	N	FGN	486	0	0	0	216	0	702	0
ACE	LANZAROTE, CANARY ISLANDS	N	FGN	76	0	688	0	1115	0	1879	0
ACK	NANTUCKET, MA, USA	N	YES	0	0	7	0	9	0	16	0
ACV	EUREKA ARCATA, CA, USA	N	YES	2616	0	739	0	0	0	3355	0
ADB	IZMIR, TURKEY	N	FGN	0	0	236	0	426	0	662	0
ADD	ADDIS ABABA, ETHIOPIA	N	FGN	148	0	1538	1	1585	0	3271	1
ADE	ADEN, YEMEN	N	FGN	1346	0	1022	0	1242	0	3610	0
ADK	ADAK ISLAND, AS, USA	N	NO	0	0	16	0	0	0	16	0
ADL	ADELAIDE, SA, AUSTRALIA	S	FGN	4738	1	5568	0	9550	0	19856	1
ADQ	KODIAK, AS, USA	N	NO	2290	0	2500	0	2700	1	7490	1
ADZ	SAN ANDRES ISLAND, COLOMBIA	N	FGN	526	0	624	0	700	0	1850	0
AEP	BUENOS AIRES - NEWBURY, ARGENTINA	S	FGN	23291	0	22170	1	21296	0	66757	1
AES	ALESUND, NORWAY	N	FGN	8988	0	8364	0	8060	0	25412	0
AGA	AGADOR, MOROCCO	N	FGN	601	0	684	0	1164	0	2449	0
AGP	MALAGA, SPAIN	N	FGN	2434	0	3226	0	3213	0	8873	0
AGR	AGRA, INDIA	N	FGN	1980	1	2074	1	1616	1	5670	3
AGS	AUGUSTA, GA, USA	N	YES	1579	0	1881	0	1270	0	4730	0
AHB	ABHA, SAUDI ARABIA	N	FGN	2026	0	5425	0	5606	0	13057	0
AHU	AL HOCEIMA, MOROCCO	N	FGN	292	0	338	0	346	0	976	0
AJA	AJACCIO, CORSICA, FRANCE	N	FGN	59	1	87	0	177	1	323	2
AJF	JOUF, SAUDI ARABIA	N	FGN	1128	0	1258	0	1280	0	3666	0
AJU	ARACAJU, BRAZIL	S	FGN	1460	0	2592	1	5242	0	9294	1
AKL	AUCKLAND, NEW ZEALAND	S	FGN	16985	2	26503	0	26856	1	70344	3
AKN	KING SALMON, AS, USA	N	NO	1444	0	1832	0	1956	0	5232	0
AKR	AKURE, NIGERIA	N	FGN	238	0	354	0	244	0	836	0
ALB	ALBANY, NY, USA	N	YES	4461	2	6510	0	6964	0	17935	2
ALC	ALICANTE, SPAIN	N	FGN	148	0	1070	1	1796	1	3014	2
ALG	ALGIERS, ALGERIA	N	FGN	14258	1	13443	0	13905	0	41606	1
ALY	ALEXANDRIA, ARA REP OF EGYPT	N	FGN	2104	0	1507	0	2123	0	5734	0
AMA	AMARILLO, TX, USA	N	YES	12811	0	11122	0	10270	0	34203	0
AMD	AHMEDABAD, INDIA	N	FGN	5932	2	6180	4	4964	1	17076	7
AMM	AMMAN, JORDAN	N	FGN	2131	0	1859	0	1684	0	5674	0
AMS	AMSTERDAM, NETHERLANDS	N	FGN	19047	4	29304	4	41353	6	89704	14
ANC	ANCHORAGE, AS, USA	N	NO	18977	0	17295	0	18186	0	54458	0
ANF	ANTOFAGASTA, CHILE	S	FGN	1434	0	1635	0	2356	0	5425	0
ANI	ANIAK, AS, USA	N	NO	460	0	714	0	1108	0	2282	0
ANR	ANTWERP, BELGIUM	N	FGN	540	0	0	0	0	0	540	0
ANU	ANTIGUA, WEST INDIES	N	FGN	18	0	0	0	0	0	18	0
AOR	ALOR SETAR, MALAYSIA	N	FGN	1886	1	1884	0	2154	0	5924	1
APL	NAMPULA, MOZAMBIQUE	S	FGN	1144	0	1156	0	520	0	2820	0
APW	APIA, WESTERN SAMOA	S	FGN	858	0	264	0	158	0	1280	0
AQI	QAISUMAH, SAUDI ARABIA	N	FGN	494	0	552	0	642	0	1688	0
ARD	ALOR, INDONESIA	N	FGN	0	1	0	0	0	0	0	1
ARI	ARICA, CHILE	S	FGN	970	0	1308	0	1452	0	3730	0
ARN	STOCKHOLM ARLANDA, SWEDEN	N	FGN	7556	0	8439	0	10086	0	26081	0
ASM	ASMARA, ETHIOPIA	N	FGN	0	0	769	0	636	0	1405	0
ASP	ALICE SPRINGS, N.T., AUSTRALIA	S	FGN	1816	0	3728	0	5198	1	10742	1
ASU	ASUNCION, PARAGUAY	S	FGN	498	0	234	0	104	0	836	0
ASW	ASWAN, ARAB REP OF EGYPT	N	FGN	4968	0	7042	0	8616	0	20626	0
ATH	ATHENS, GREECE	N	FGN	24758	0	25267	0	31341	1	81366	1
ATL	ATLANTA, GA, USA	N	YES	42143	0	43773	0	47101	1	133017	1
ATM	ALTAMIRA, BRAZIL	S	FGN	416	0	420	0	416	0	1252	0
ATQ	AMRITSAR, INDIA	N	FGN	1846	0	1838	0	1460	0	5144	0
AUA	ARUBA, ARUBA	N	FGN	50	0	9	0	32	0	91	0
AUH	ABU DHABI, U. A. EMIRATES	N	FGN	4023	0	4381	0	4479	0	12883	0
AUS	AUSTIN, TX, USA	N	YES	33326	1	31454	2	32211	0	96991	3
AUX	ARAGUAINA, BRAZIL	S	FGN	244	0	420	0	582	0	1246	0
AVL	ASHEVILLE, NC, USA	N	YES	1298	0	1594	0	2212	0	5104	0
AVP	WILKES-BARRE/SCRANTON, PA, USA	N	YES	114	0	555	0	373	0	1042	0
AWZ	AHWAZ, IRAN	N	FGN	0	0	0	0	724	0	724	0
AXD	ALEXANDROUPOLIS, GREECE	N	FGN	908	0	1028	0	819	0	2755	0
AXT	AKITA, JAPAN	N	FGN	591	0	609	0	538	0	1738	0
AYT	ANTALYA, TURKEY	N	FGN	52	0	62	0	68	0	182	0
AZD	YAZD, IRAN	N	FGN	0	0	522	0	730	0	1252	0
AZO	KALAMAZOO, MI, USA	N	YES	2800	0	2802	0	2857	0	8459	0

AIRPORT	APTDEF	HEMISP	HR	CONUS	STGFY87	ING1	STGFY88	ING2	STGFY89	ING3	STG737	INGS
AZR	ADRAR, ALGERIA	N	FGN		818	0	718	0	732	0	2268	0
BAH	BAHRAIN, BAHRAIN	N	FGN		11933	1	10623	0	10944	0	33500	1
BAQ	BARRANQUILLA, COLOMBIA	N	FGN		105	0	104	0	104	0	313	0
BBI	BHUBANESWAR, INDIA	N	FGN		2086	1	2160	0	2008	0	6254	1
BCN	BARCELONA, SPAIN	N	FGN		4166	0	4707	0	7749	0	16622	0
BDH	BANDAR LENGEH, IRAN	N	FGN		1460	0	1464	0	832	0	3756	0
BDL	HARTFORD, CN, USA	N	YES		15001	0	14757	0	15366	0	45124	0
BDQ	VADODARA, INDIA	N	FGN		1925	0	1866	1	1888	0	5679	1
BDT	BADO LITE, ZAIRE	N	FGN		208	0	278	0	282	0	768	0
BEG	BELGRADE, YUGOSLAVIA	N	FGN		10759	1	13303	1	14455	1	38517	3
BEL	BELEM, BRAZIL	S	FGN		5505	0	9161	0	12314	0	26980	0
BEN	BENGHAZI, LIBYAN A JAMAHIRIYA	N	FGN		0	0	62	0	444	0	506	0
BET	BETHEL, AS, USA	N	NO		3190	0	3238	0	3158	0	9586	0
BEW	BEIRA, MOZAMBIQUE	S	FGN		1304	0	1112	0	1094	0	3510	0
BFL	BAKESFIELD, CA, USA	N	YES		2742	0	1037	0	0	0	3779	0
BFN	BLOEMFONTEIN, SOUTH AFRICA	S	FGN		3954	0	4710	1	5494	6	14158	7
BFS	BELFAST, N. IRELAND	N	FGN		1570	0	2915	2	6866	0	11351	2
BFX	BAFOUSSAM, CAMEROON	N	FGN		0	0	14	0	0	0	14	0
BGF	BANGUI, CEN. AFRICAN REPUBLIC	N	FGN		272	0	340	0	373	0	985	0
BGI	BARBADOS, BARBADOS	N	FGN		52	0	52	0	52	0	156	0
BGM	BINGHAMTON, NY, USA	N	YES		0	0	130	0	484	0	614	0
BGO	BERGEN, NORWAY	N	FGN		12038	0	14288	0	15923	0	42249	0
BGR	BANGOR, MA, USA	N	YES		0	0	0	0	204	0	204	0
BGW	BAGHDAD, IRAQ	N	FGN		0	0	31	0	38	0	69	0
BHH	BISHA, SAUDI ARABIA	N	FGN		1740	0	1779	0	1517	0	5036	0
BHI	BAHIA BLANCA, ARGENTINA	S	FGN		2162	0	2412	0	2400	3	6974	3
BHJ	BHUJ, INDIA	N	FGN		730	0	732	0	730	0	2192	0
BHM	BIRMINGHAM, AL, USA	N	YES		6048	2	11193	1	9467	1	26708	4
BHO	BHOPAL, INDIA	N	FGN		1828	0	2462	1	1924	1	6214	2
BHU	BHAVNAGAR, INDIA	N	FGN		730	0	732	0	538	0	2000	0
BHX	BIRMINGHAM, ENGLAND (UK)	N	FGN		2307	1	2630	1	3753	0	8690	2
BHZ	BELO HORIZONTE, BRAZIL	S	FGN		0	0	0	0	0	1	0	1
BIA	BASTIA, CORSICA, FRANCE	N	FGN		234	0	300	0	200	0	734	0
BIL	BILLINGS, MT, USA	N	YES		7285	0	4583	0	3874	0	15742	0
BIO	BILBAO, SPAIN	N	FGN		622	0	628	0	677	0	1927	0
BIQ	BIARRITZ, FRANCE	N	FGN		52	0	52	0	52	0	156	0
BIS	BISMARCK, ND, USA	N	YES		3396	0	3760	0	2746	0	9902	0
BJL	BANJUL, GAMBIA	N	FGN		472	0	420	0	420	1	1312	1
BJM	BUJUMBURA, BURUNDI	S	FGN		245	0	245	0	384	0	874	0
BJR	BAHAR DAR, ETHIOPIA	N	FGN		0	0	572	1	296	0	868	1
BKI	KOTA KINABALU, SABAH, MALAYSIA	N	FGN		8699	0	9134	0	11424	0	29257	0
BKK	BANGKOK, THAILAND	N	FGN		7329	0	7596	0	7058	0	21983	0
BKO	BAMAKO, MALI	N	FGN		50	0	54	0	82	0	186	0
BKY	BUKAVU, ZAIRE	S	FGN		104	0	106	0	72	0	282	0
BLI	BELLINGHAM, WA, USA	N	YES		0	0	2	0	237	0	239	0
BLL	BILLUND, DENMARK	N	FGN		2177	0	2178	0	2393	0	6748	0
BLQ	BOLOGNA, ITALY	N	FGN		310	0	374	0	634	0	1318	0
BLR	BANGALORE, INDIA	N	FGN		5886	3	8160	2	9204	2	23250	7
BME	BROOME, W.A., AUSTRALIA	S	FGN		0	0	0	0	2	0	2	0
BNA	NASHVILLE, TN, USA	N	YES		17920	0	22380	1	21447	0	61747	1
BND	BANDAR ABBAS, IRAN	N	FGN		1460	0	1922	0	1354	0	4736	0
BNE	BRISBANE, QLD, AUSTRALIA	S	FGN		12830	0	15610	2	21839	0	50279	2
BNJ	BEWIN CITY, NIGERIA	N	FGN		2127	0	1875	0	1666	0	5668	0
BNJ	BONN, FRG	N	FGN		0	0	0	0	0	0	0	0
BOD	BORDEAUX, FRANCE	N	FGN		688	0	790	0	1016	0	2494	0
BOH	BOURNEMOUTH, ENGLAND, UK	N	FGN		0	0	0	0	0	1	0	1
BOI	BOISE, ID, USA	N	YES		5399	0	5655	0	8309	0	19363	0
BOM	BOMBAY, INDIA	N	FGN		16848	2	15854	2	15490	0	48192	4
BOO	BODO, NORWAY	N	FGN		2868	0	3254	0	3286	0	9408	0
BOS	BOSTON, MA, USA	N	YES		30820	0	34903	1	37878	0	103601	1
BRC	SAN CARLOS DE BARILOCHE, ARGENTINA	S	FGN		1663	0	1656	0	1176	0	4495	0
BRE	BREMEN, FED REP OF GERMANY	N	FGN		4526	0	5729	0	5530	2	15785	2
BRS	BRISTOL, ENGLAND (UK)	N	FGN		2	1	0	2	16	0	18	3
BRU	BRUSSELS, BELGIUM	N	FGN		31942	2	32748	4	36110	3	100800	9
BRW	BARROW, AS, USA	N	NO		1897	0	1960	0	1946	0	5803	0
BSB	BRASILIA, BRAZIL	S	FGN		22788	0	30251	0	35278	0	88317	0
BSK	BISKRA, ALGERIA	N	FGN		0	0	0	0	96	0	96	0
BSL	BASEL/MULHOUSE, SWITZERLAND	N	FGN		554	0	538	0	528	0	1620	0
BTM	BUTTE, MT, USA	N	YES		1460	0	1464	0	1454	0	4378	0
BTR	BATON ROUGE, LA, USA	N	YES		2944	0	2065	0	1273	0	6282	0
BTV	BURLINGTON, VT, USA	N	YES		2544	0	2678	0	6126	0	11348	0
BUD	BUDAPEST, HUNGARY	N	FGN		1660	0	1468	1	4764	0	7892	1
BUE	BUENOS AIRES, ARGENTINA	S	FGN		0	0	0	1	0	0	0	1
BUF	BUFFALO, NY, USA	N	YES		17704	0	16940	0	14779	0	49423	0
BUQ	BULAWAYO, ZIMBABWE	S	FGN		1834	0	2870	0	2808	0	7512	0

AIRPORT	APTDEF	HEMISPHR	CONUS	STGFY87	ING1	STGFY88	ING2	STGFY89	ING3	STG737	INGS
BUR	BURBANK, CA, USA	N	YES	11187	0	14262	0	20498	0	45947	0
BUX	BUNA, ZAIRE	N	FGN	210	0	208	0	166	0	584	0
BUZ	BUSHEHR, IRAN	N	FGN	88	0	24	0	0	0	112	0
BVB	BOA VISTA, BRAZIL	N	FGN	1314	0	1426	0	1914	0	4654	0
BVH	VITHENA, BRAZIL	S	FGN	0	0	62	0	254	0	316	0
BWI	BALTIMORE, MD, USA	N	YES	54435	1	60614	0	71566	0	186615	1
BWN	BASERI BEGAWAN, BRUNEI DARUSSALAM	N	FGN	2951	0	2782	0	3248	0	8981	0
BXO	BISSAU, GUINEA BISSAU	N	FGN	20	0	80	0	0	0	100	0
BZE	BELIZE CITY, BELIZE	N	FGN	3647	0	4416	0	5541	0	13604	0
BZN	BOZEMAN, MT, USA	N	YES	5200	0	4588	0	5762	0	15550	0
BZR	BEZIERS, FRANCE	N	FGN	0	0	0	0	1	0	1	0
BZV	BRAZZAVILLE, PEOP REP OF CONGO	S	FGN	1406	0	1321	0	1180	0	3907	0
CAB	CABINDA, ANGOLA	S	FGN	1042	0	966	0	730	0	2738	0
CAE	COLUMBIA, SC, USA	N	YES	8213	0	8051	0	4297	0	20561	0
CAG	CAGLIARI, ITALY	N	FGN	0	0	0	1	0	0	0	1
CAI	CAIRO, ARAB REP OF EGYPT	N	FGN	8057	0	8970	0	10132	0	27159	0
CAK	AKRON/CANTON, OH, USA	N	YES	2241	0	2582	0	1398	0	6221	0
CAN	GUANGZHOU, P. R. CHINA	N	FGN	13955	0	16177	0	14550	0	44682	0
CAS	CASABLANCA, MOROCCO	N	FGN	0	0	8	1	8	0	16	1
CAY	CAYENNE, FRENCH GUIANA	N	FGN	208	0	367	0	415	0	990	0
CBD	CAR NICOBAR, INDIA	N	FGN	40	0	106	0	104	0	250	0
CBH	BECHAR, ALGERIA	N	FGN	1455	0	1258	0	1274	0	3987	0
CBQ	CALABAR, NIGERIA	N	FGN	1935	0	1783	0	1221	0	4939	0
CBR	CANBERRA, A.C.T., AUSTRALIA	S	FGN	5600	1	5064	0	6719	0	17383	1
CCJ	CALICUT, INDIA	N	FGN	0	0	174	0	536	0	710	0
CCP	CONCEPCION, CHILE	S	FGN	1184	0	1484	0	1444	0	4112	0
CCR	CONCORD, CA, USA	N	YES	0	0	0	0	37	0	37	0
CCS	CARACAS, VENEZUELA	N	FGN	0	0	52	0	52	0	104	0
CCU	CALCUTTA, INDIA	N	FGN	10798	2	11583	1	11041	0	33422	3
CDG	PARIS DE GAULLE, FRANCE	N	FGN	25514	1	28834	2	32635	0	86983	3
CDV	CORDOVA, AS, USA	N	NO	1514	0	1516	0	1512	0	4542	0
CEO	WACO KUNGO, ANGOLA	S	FGN	10	0	4	0	0	0	14	0
CFU	CORFU, GREECE	N	FGN	746	0	1152	0	1224	0	3122	0
CGB	CUJABA MATO GROSSO, BRAZIL	S	FGN	9184	0	8652	0	8360	0	26196	0
CGH	SAO PAULO-CONGONHAS, BRAZIL	S	FGN	1082	0	2410	0	2600	0	6092	0
CGK	JAKARTA-SOEKARNO, INDONESIA	S	FGN	626	0	630	0	687	0	1943	0
CGN	COLOGNE BONN, FRG	N	FGN	18161	1	19445	0	19597	1	57203	2
CGO	ZHENGZHOU, P. R. CHINA	N	FGN	208	0	394	0	341	0	943	0
CGP	CHITTAGONG, BANGLADESH	N	FGN	0	0	0	0	80	0	80	0
CGQ	CHANGCHUN, P. R. CHINA	N	FGN	62	0	70	0	268	0	400	0
CGR	CAMPO GRANDE, BRAZIL	S	FGN	6770	0	7800	3	8854	0	23424	3
CHA	CHATTANOOGA, TN, USA	N	YES	1618	0	1704	0	984	0	4306	0
CHC	CHRISTCHURCH, NEW ZEALAND	S	FGN	17095	7	24202	0	26870	0	68167	7
CHM	CHIMBOTE, PERU	S	FGN	0	0	0	0	98	0	98	0
CHO	CHARLOTTESVILLE, VA, USA	N	YES	1814	0	808	0	831	0	3453	0
CHQ	CHANIA, CRETE, GREECE	N	FGN	856	0	793	0	1554	0	3203	0
CHS	CHARLESTON, SC, USA	N	YES	7219	0	8528	0	8385	0	24132	0
CID	CEDAR RAPIDS/IOWA CITY, IO, USA	N	YES	3800	0	2995	0	3565	1	10360	1
CIX	CHICLAYO, PERU	S	FGN	286	0	450	0	800	0	1536	0
CJB	COIMBATORE, INDIA	N	FGN	1528	0	1674	2	1460	0	4662	2
CJC	CALAMA, CHILE	S	FGN	626	0	420	0	630	0	1676	0
CJU	CHEJU, REP OF KOREA	N	FGN	0	0	0	0	1708	1	1708	1
CKG	CHONGQING, P. R. CHINA	N	FGN	714	0	787	0	1138	0	2639	0
CKS	CARAJAS, BRAZIL	S	FGN	417	0	417	0	188	0	1022	0
CKY	CONAKRY, GUINEA	N	FGN	550	0	707	0	947	0	2204	0
CLE	CLEVELAND, OH, USA	N	YES	24028	1	40166	1	55625	1	119819	3
CLT	CHARLOTTE, NC, USA	N	YES	95251	2	113302	1	122448	0	331001	3
CMB	COLOMBO, SRI LANKA	N	FGN	3021	0	3078	0	3254	1	9353	1
CMG	CORUMBA, MATO GROSSO, BRAZIL	S	FGN	1460	1	1464	0	1068	0	3992	1
CMH	COLUMBUS, OH, USA	N	YES	8004	0	9329	0	9980	0	27313	0
CMI	CHAMPAIGN, IL, USA	N	YES	2186	0	2195	0	2188	0	6569	0
CMN	MOHAMEDV, CASABLANCA, MOROCCO	N	FGN	4767	0	6241	0	6621	0	17629	0
CND	CONSTANTO, ROMANIA	N	FGN	0	0	0	0	0	0	0	0
CNF	BELO HORIZONTE-CONFINS, BRAZIL	S	FGN	19683	0	19554	0	17047	0	56284	0
CNQ	CORRIENTES, ARGENTINA	S	FGN	1100	0	544	0	312	0	1956	0
CNS	CAIRNS, QLD, AUSTRALIA	S	FGN	4850	1	6049	0	7815	0	18714	1
CNX	CHIANG MAI, THAILAND	N	FGN	728	0	435	0	18	0	1181	0
COK	COCHIN, INDIA	N	FGN	5457	1	4646	2	4380	0	14483	3
COO	COTONOU, BENIN	N	FGN	1120	0	1038	0	838	0	2996	0
COR	CORDOBA, ARGENTINA	S	FGN	6772	0	6194	1	5551	0	18517	1
COS	COLORADO SPRINGS, CO, USA	N	YES	8004	0	8313	1	10804	0	27121	1
CPH	COPENHAGEN, DENMARK	N	FGN	11419	1	14184	0	15634	1	41237	2
CPO	CUPIATO, CHILE	S	FGN	0	0	320	0	632	0	952	0
CPQ	CAMPINAS, BRAZIL	S	FGN	1056	0	1207	0	889	0	3152	0
CPR	CASPER, WY, USA	N	YES	4230	0	2902	0	2170	0	9302	0

AIRPORT	APTDEF	HEMISPHR	CONUS	STGFY87	ING1	STGFY88	ING2	STGFY89	ING3	STG737	INGS
CPT	CAPE TOWN, SOUTH AFRICA	S	FGN	8545	1	10490	0	11738	2	30773	3
CPV	CAMPINA GRANDE, BRAZIL	S	FGN	626	0	628	0	624	0	1878	0
CRD	COMODORO RIVADAVIA, ARGENTINA	S	FGN	2553	0	2041	0	1509	0	6103	0
CRP	CORPUS CHRISTI, TX, USA	N	YES	5584	0	5292	0	5290	1	16166	1
CRW	CHARLESTON, WV, USA	N	YES	4478	0	5070	1	2915	0	12463	1
CTA	CATANIA, ITALY	N	FGN	252	0	665	0	838	0	1755	0
CTC	CATAMARCA, ARGENTINA	S	FGN	778	0	782	1	730	0	2290	1
CTG	CARTAGENA, COLOMBIA	N	FGN	105	0	104	0	104	0	313	0
CTS	SAPPORO-CHITOSE, JAPAN	N	FGN	1398	0	2908	0	2784	0	7090	0
CTU	CHENGDU, P.R. CHINA	N	FGN	2138	1	1728	0	2749	1	6615	2
CUN	CANCUN, MEXICO	N	FGN	634	0	1212	0	602	0	2448	0
CUR	CURACAO, NETH ANTILLES	N	FGN	20	0	0	0	0	0	20	0
CUT	CUTRAL-CO, ARGENTINA	S	FGN	0	0	18	0	0	0	18	0
CVG	CINCINNATI, OH, USA	N	YES	14496	0	18777	0	16460	0	49733	0
CVT	COVENTRY, ENG, UK	N	FGN	0	0	0	0	42	0	42	0
CWB	CURITIBA, PARANA, BRAZIL	S	FGN	6532	0	8720	0	10110	2	25362	2
CWL	CARDIFF, WALES, UK	N	FGN	0	0	0	1	0	0	0	1
CXI	CHRISTMAS ISLAND, REP OF KIRIBATI	N	FGN	106	0	104	0	104	0	314	0
CYI	CHIAYI, TAIWAN	N	FGN	730	0	732	0	730	0	2192	0
CZL	CONSTANTINE, ALGERIA	N	FGN	3352	0	3129	0	3101	0	9582	0
CZS	CRUZEIRO DO SUL, ACRE, BRAZIL	S	FGN	344	0	436	0	454	0	1234	0
CZX	CHANGZHOU, P. R. CHINA	N	FGN	208	0	227	0	224	0	659	0
DAB	DAYTONA BEACH, FL, USA	N	YES	3532	1	4032	0	2840	1	10404	2
DAC	DHAKA, BANGLADESH	N	FGN	934	0	734	0	789	0	2457	0
DAL	LOVE DALLS/FT. WORTH, TX, USA	N	YES	75124	4	76295	3	76191	3	227610	10
DAM	DAMASCUS, SYRIA	N	FGN	523	0	883	0	905	0	2311	0
DAR	DAR ES SALAAM, TANZANIA	S	FGN	3407	0	2968	0	2961	0	9336	0
DAY	DAYTON, OH, USA	N	YES	37652	1	43020	2	48201	1	128873	4
DBV	DUBROVNIK, YUGOSLAVIA	N	FGN	1806	0	2366	0	2730	0	6902	0
DCA	NATIONAL, WASHINGTON, DC, USA	N	YES	22108	0	26412	0	30911	1	79431	1
DEC	DECATUR, IL, USA	N	YES	0	0	0	0	0	0	0	0
DEL	DELHI, INDIA	N	FGN	15987	0	16401	3	17645	2	50033	5
DEN	STAPLETON INT'L, DENVER, CO, USA	N	YES	112673	2	113634	2	106309	0	332616	4
DET	DETROIT CITY, MI, USA	N	YES	0	0	2064	0	10902	1	12966	1
DEU	SOMEWHERE OVER GERMANY	N	FGN	0	0	0	1	0	0	0	1
DFW	DALLAS/FT WORTH, TX, USA	N	YES	51130	1	48254	1	53615	0	152999	2
DHA	DHAHRAN, SAUDI ARABIA	N	FGN	7902	0	6474	0	6302	0	20678	0
DIB	DIBRUGARH, INDIA	N	FGN	816	0	864	0	852	0	2532	0
DIE	ANTSIRANANA, MADAGASCAR	S	FGN	610	0	610	0	576	0	1796	0
DIR	DIRE DAWA, ETHIOPIA	N	FGN	38	0	628	0	1100	0	1766	0
DJE	DJERBA, TUNISIA	N	FGN	547	0	267	0	303	0	1117	0
DJG	DJANET, ALGERIA	N	FGN	466	0	532	0	564	0	1562	0
DKR	DAKAR, SENEGAL	N	FGN	467	0	580	0	653	0	1700	0
DLA	DOUALA, REP OF CAMEROON	N	FGN	5262	0	4691	0	4654	0	14607	0
DLC	DALIAN, P. R. CHINA	N	FGN	0	0	44	0	130	0	174	0
DLG	DILLINGHAM, AS, USA	N	NO	1444	0	1622	0	1660	0	4726	0
DLH	DULUTH, MN, USA	N	YES	0	0	0	0	0	1	0	1
DMU	DIMAPUR, INDIA	N	FGN	0	0	0	0	326	0	326	0
DOD	DODOMA, TANZANIA	S	FGN	16	0	0	0	0	0	16	0
DOH	DOHA, QATAR	N	FGN	8859	0	9310	0	9325	0	27494	0
DPS	DENPASAR, INDONESIA	S	FGN	104	0	104	0	106	0	314	0
DRO	DURANGO, CO, USA	N	YES	2233	0	1462	0	1442	0	5137	0
DRW	DARWIN, N.T., AUSTRALIA	S	FGN	1107	0	2092	0	2513	0	5712	0
DSM	DES MOINES, IO, USA	N	YES	7748	0	9329	0	7785	0	24862	0
DTW	WAYNE CO, DETROIT, MI, USA	N	YES	16765	0	24028	0	21130	1	61923	1
DUB	DUBLIN, REPUBLIC OF IRELAND	N	FGN	19308	1	23823	1	28519	1	71650	3
DUD	DUNEDIN, NEW ZEALAND	S	FGN	4145	0	4379	1	5890	0	14414	1
DUR	DURBAN, SOUTH AFRICA	S	FGN	6925	2	7739	2	9624	1	24288	5
DUS	DUESSELDORF, FRG	N	FGN	30119	2	32964	5	33450	6	96533	13
DUT	DUTCH HARBOR, AS, USA	N	NO	828	0	1116	0	1432	0	3376	0
DXB	DUBAI, U. A. EMIRATES	N	FGN	3134	0	2234	0	2719	0	8087	0
EAM	NEJIRAN, SAUDI ARABIA	N	FGN	2392	0	2412	0	2552	1	7356	1
EBB	ENTEBBE KAMPALA, UGANDA	N	FGN	39	0	167	0	459	0	665	0
EBD	EL OBEID, SUDAN	N	FGN	632	0	968	0	512	0	2112	0
EBJ	ESBJERG, DENMARK	N	FGN	482	0	284	0	156	0	922	0
EDI	EDINBURGH, SCOTLAND	N	FGN	1040	0	1988	0	7123	1	10151	1
EFL	KEFALONIA, GREECE	N	FGN	780	0	786	0	776	0	2342	0
EJH	WEDJH, SAUDI ARABIA	N	FGN	784	0	736	0	730	0	2250	0
ELF	EL FASHER, SUDAN	N	FGN	0	0	8	0	164	0	172	0
ELG	EL GOLEA, ALGERIA	N	FGN	416	0	416	0	416	0	1248	0
ELM	ELMIRA, NY, USA	N	YES	0	0	260	0	0	0	260	0
ELP	EL PASO, TX, USA	N	YES	38902	0	39117	0	41757	0	119776	0
ELQ	GASSIM, SAUDI ARABIA	N	FGN	4652	0	4072	0	3224	0	11948	0
ELS	EAST LONDON, SOUTH AFRICA	S	FGN	9987	3	11104	0	10476	2	31567	5
ELU	EL QUED, ALGERIA	N	FGN	288	0	312	0	426	0	1026	0

AIRPORT	APTDEF	HEMISP	CONUS	STGFY87	ING1	STGFY88	ING2	STGFY89	ING3	STG737	INGS
EMA	EAST MIDLANDS, ENGLAND	N	FGN	291	0	269	0	322	2	882	2
ENU	ENUGU, NIGERIA	N	FGN	3138	0	2980	0	2199	0	8317	0
EQS	ESQUEL, ARGENTINA	S	FGN	1116	0	1066	0	850	0	3032	0
ERI	ERIE, PA, USA	N	YES	1772	0	1618	0	1535	0	4925	0
ESB	ANKARA-ESENBAGA, TURKEY	N	FGN	0	0	695	0	1329	0	2024	0
ESR	EL SALVADOR, CHILE	S	FGN	836	0	772	0	728	0	2336	0
ETH	ELAT, ISRAEL	N	FGN	4	0	14	0	2	0	20	0
EUG	EUGENE, OR, USA	N	YES	3493	0	2908	0	5201	0	11602	0
EUN	LAAYOUNE, MOROCCO	N	FGN	244	0	503	0	317	0	1064	0
EVE	EVENES, NORWAY	N	FGN	1520	0	1874	0	1778	0	5172	0
EVV	EVANSVILLE, IN, USA	N	YES	2468	0	2519	0	1898	0	6885	0
EWR	NEWARK, NEW YORK, NY, USA	N	YES	78323	1	85323	2	83555	1	247201	4
EZE	BUENOS AIRES-EZEIZA ARPT, ARGENTINA	S	FGN	424	1	838	0	1483	0	2745	1
FAE	FAROE ISLANDS, DENMARK	N	FGN	756	0	837	0	752	0	2345	0
FAI	FAIRBANKS, AS, USA	N	NO	3674	0	3816	0	3756	0	11246	0
FAO	FARO, PORTUGAL	N	FGN	1069	0	1712	1	1300	0	4081	1
FAR	FARGO, ND, USA	N	YES	1561	0	383	0	445	0	2389	0
FAT	FRESNO, CA, USA	N	YES	9993	1	6833	1	4983	0	21809	2
FAY	FAYETTEVILLE, NC, USA	N	YES	3260	0	3643	0	2786	0	9689	0
FBM	LUBUMBASHI, ZAIRE	S	FGN	262	0	378	0	444	0	1084	0
FBU	FORNEBU, OSLO, NORWAY	N	FGN	11420	0	29599	0	33347	0	74366	0
FCA	KALISPELL GLACIER NAT'L OK, MT, USA	N	YES	1460	0	1460	0	1067	0	3987	0
FCO	DA VINCI, ROME, ITALY	N	FGN	4538	0	6614	1	8484	1	19636	2
FEZ	FEZ, MOROCCO	N	FGN	146	0	408	0	640	0	1194	0
FIH	KINSHASA, ZAIRE	S	FGN	2324	0	2776	0	2920	0	8020	0
FJR	AL FUJAIRAH, U.A.E.	N	FGN	0	0	208	0	225	0	433	0
FKI	KISANGANI, ZAIRE	N	FGN	1170	0	1596	0	1388	0	4154	0
FLI	FT LAUDERDALE, FL, USA	N	YES	12566	1	12687	0	17037	0	42290	1
FLN	FLORIANOPOLIS, BRAZIL	S	FGN	4180	0	5040	0	3909	0	13129	0
FMA	FORMOSA, ARGENTINA	S	FGN	682	0	696	1	648	0	2026	1
FMI	KALEMIE, ZAIRE	S	FGN	524	0	440	0	414	0	1378	0
FMO	MUENSTER, GERMANY	N	FGN	0	0	0	0	69	0	69	0
FNA	FREETOWN, SIERRA LEONE	N	FGN	112	0	0	0	0	0	112	0
FNC	FUNCHAL - MADEIRA, PORTUGAL	N	FGN	3737	1	4944	0	6276	1	14957	2
FNT	FLINT, MI, USA	N	YES	2186	0	2300	0	2923	1	7409	1
FOC	FUZHOU, P. R. CHINA	N	FGN	534	0	1116	0	1082	0	2732	0
FOE	FORBES, TOPEKA, KA, USA	N	YES	1407	0	62	0	0	0	1469	0
FOR	FORTALEZA, CEARA, BRAZIL	S	FGN	4798	0	6068	0	8582	0	19448	0
FPO	FREEPORT, BAHAMAS	N	FGN	2666	0	5156	0	4876	0	12698	0
FRA	FRANKFURT, FRG	N	FGN	52274	8	56256	2	64168	6	172698	16
FRL	FORLI, ITALY	N	FGN	0	0	0	0	2	0	2	0
FSD	SIOUX FALLS, SD, USA	N	YES	6410	0	2897	0	5603	0	14910	0
FTU	FT DAUPHIN, MADAGASCAR	S	FGN	332	0	328	0	330	0	990	0
FUE	FUERTEVENTURA, CANARY IS.	N	FGN	0	0	216	0	228	0	444	0
FUK	FUKUOKA, JAPAN	N	FGN	730	0	410	0	62	0	1202	0
FWA	FT WAYNE, IN, USA	N	YES	2580	0	2344	0	2444	0	7368	0
GAJ	YAMAGATA, HONSHU, JAPAN	N	FGN	1154	0	1426	1	1330	0	3910	1
GAL	GALENA, AS, USA	N	NO	0	0	270	0	182	0	452	0
GAU	GAUHATI, INDIA	N	FGN	3934	1	5832	0	6143	0	15909	1
GBE	GABORONE, BOTSWANA	S	FGN	527	0	500	0	246	0	1273	0
GCI	GUERNSEY, CHANNEL IS, UK	N	FGN	0	0	0	0	40	0	40	0
GDJ	GUADALAJARA, MEXICO	N	FGN	0	0	38	0	92	0	130	0
GEG	SPOKANE, WA, USA	N	YES	8549	0	5588	0	6999	0	21136	0
GEO	GEORGETOWN, GUYANA	N	FGN	0	0	8	0	28	0	36	0
GHA	GHARDAIA, ALGERIA	N	FGN	1014	0	858	0	1032	0	2904	0
GHB	GOVERNORS HARBOUR, BAHAMAS	N	FGN	36	0	0	1	0	0	36	1
GHU	GUALEGUAYCHU, ARGENTINA	S	FGN	0	1	0	0	0	0	0	1
GIB	GIBRALTAR, GIBRALTAR	N	FGN	1788	0	2904	0	3440	0	8132	0
GIG	RIO DE JANEIRO INT'L, BRAZIL	S	FGN	27048	0	33116	1	34612	1	94776	2
GIZ	GIZAN, SAUDI ARABIA	N	FGN	5781	0	6019	0	6070	0	17870	0
GJT	GRAND JUNCTION, CO, USA	N	YES	2416	0	3572	0	2962	0	8950	0
GLA	GLASGLOW, SCOTLAND	N	FGN	687	0	1605	0	5763	0	8055	0
GMA	GEMENA, ZAIRE	N	FGN	312	0	332	0	252	0	896	0
GOA	GENOA, ITALY	N	FGN	292	1	267	0	1064	0	1623	1
GOI	GOA, INDIA	N	FGN	1798	0	1554	0	1982	1	5334	1
GOM	GOMA, ZAIRE	S	FGN	104	0	446	0	554	0	1104	0
GOP	GORAKHPUR, INDIA	N	FGN	486	0	328	0	404	0	1218	0
GOT	GOTHENBURG, SWEDEN	N	FGN	3846	0	4517	2	5431	0	13794	2
GOU	GAROUA, REP OF CAMEROON	N	FGN	1954	0	1822	0	1338	0	5114	0
GOV	GOVE, N.T., AUSTRALIA	S	FGN	314	0	600	0	624	0	1538	0
GRB	GREEN BAY, WI, USA	N	YES	605	0	0	0	0	0	605	0
GRJ	GEORGE, SOUTH AFRICA	S	FGN	2178	0	2262	0	2253	0	6693	0
GRR	GRAND RAPIDS, MI, USA	N	YES	4831	0	3497	0	4465	0	12793	0
GRU	SAO PAULO-GUARULMOS, BRAZIL	S	FGN	41061	0	45163	0	47825	0	134049	0
GRZ	GRAZ, AUSTRIA	N	FGN	619	1	304	0	562	1	1485	2

AIRPORT	APTDEF	HEMISPHR	CONUS	STGFY87	ING1	STGFY88	ING2	STGFY89	ING3	STG737	INGS
GSO	GREENSBORO/HPT/WIN-SALEM, NC, USA	N	YES	18586	0	14989	0	15677	0	49252	0
GSP	GREENVILLE/SPARTANBURG, SC, USA	N	YES	1508	0	2324	0	2292	1	6124	1
GTF	GREAT FALLS, MT, USA	N	YES	4356	0	3398	0	2992	0	10746	0
GUA	GUATEMALA CITY, GUATEMALA	N	FGN	1667	0	2848	0	3522	0	8037	0
GUM	GUAM, GUAM	N	FGN	289	0	366	0	145	0	800	0
GVA	GENEVA, SWITZERLAND	N	FGN	10594	0	10520	1	11863	0	32977	1
GWL	GWALIOR, INDIZ	N	FGN	1460	0	1422	1	1460	0	4342	1
GWT	GALWAY, IRELAND	N	FGN	130	0	136	0	8	0	274	0
GXF	SEIYUN, YEMEN	N	FGN	26	0	0	0	0	0	26	0
GXG	NEGAGE, ANGOLA	S	FGN	382	0	314	0	0	0	696	0
GYE	GUAYAQUIL, ECUADOR	S	FGN	1609	0	0	0	0	0	1609	0
GYN	GOIANIA, BRAZIL	S	FGN	7891	0	8638	0	10582	0	27111	0
HAC	HACHIJO, JIMA ISLAND, JAPAN	N	FGN	834	1	1396	0	842	0	3072	1
HAH	MORONI-HAHAYA, COMOROS	S	FGN	266	0	343	0	222	0	831	0
HAJ	HANOVER, FED REP OF GERMANY	N	FGN	8844	0	9804	1	8722	0	27370	1
HAK	HAIKOU, P. R. CHINA	N	FGN	770	0	1508	0	1270	0	3548	0
HAM	HAMBURG, FRG	N	FGN	25535	2	27695	3	27741	4	80971	9
HAN	HANOI, SOC REP OF VIETNAM	N	FGN	152	0	158	0	242	0	552	0
HAS	HAIL, SAUDI ARABIA	N	FGN	3642	0	2720	0	2568	0	8930	0
HBA	HOBART, TASMANIA, AUSTRALIA	S	FGN	3785	0	4822	0	5322	0	13929	0
HBT	HAFR ALBAPIN, SAUDI ARABIA	N	FGN	140	0	228	0	208	0	576	0
HDN	STEAMBOAT SPRINGS, CO, USA	N	YES	0	0	0	0	88	0	88	0
HDY	HAT YAI, THAILAND	N	FGN	3094	0	2434	0	2706	0	8234	0
HEL	HELSINKI, FINLAND	N	FGN	2797	0	3382	0	4373	0	10552	0
HER	HERAKLION, GREECE	N	FGN	1780	0	2406	0	2312	0	6498	0
HGH	HANGZHOU, P. R. CHINA	N	FGN	1390	0	1619	0	1610	0	4619	0
HIR	HONIARA, GUADALCANAL, SOLOMON IS.	S	FGN	436	0	648	0	672	0	1756	0
HJR	HIROSHIMA, JAPAN	N	FGN	1460	0	1464	0	1460	0	4384	0
HKD	HAKODATE, JAPAN	N	FGN	1030	0	566	0	416	0	2012	0
HKG	HONG KONG, HONG KONG	N	FGN	2792	0	6018	0	7074	0	15884	0
HKT	PHUKET, THAILAND	N	FGN	1932	0	2110	0	2290	0	6332	0
HLN	HELENA, MT, USA	N	YES	2046	0	2188	0	1800	0	6034	0
HLZ	HAMILTON, NEW ZEALAND	S	FGN	627	0	727	0	1151	0	2505	0
HME	HASSI MESSAOUD, ALGERIA	N	FGN	256	0	118	0	268	0	642	0
HND	TOKYO-HANEDA, JAPAN	N	FGN	14398	0	12095	0	9997	1	36490	1
HNL	HONOLULU, OAHU, HA, USA	N	NO	51139	0	51563	0	58525	0	161227	0
HNM	HANA, MAUI, HA, USA	N	NO	0	0	0	0	0	1	0	1
HOD	HODEIDAH, YEMEN	N	FGN	86	0	0	0	0	0	86	0
HOF	HOFUF, SAUDI ARABIA	N	FGN	992	0	960	0	854	0	2806	0
HOR	HORTA FAIAL ISLAND, PORTUGAL	N	FGN	92	0	144	0	188	0	424	0
HOU	HOUSTON, TX, USA	N	YES	71429	3	81688	4	86754	2	239871	9
HPN	WHITE PLAINS, NY, USA	N	YES	2159	0	2049	0	1990	0	6198	0
HRB	HARBIN, MANCHURIA, P. R. CHINA	N	FGN	210	0	147	0	204	0	561	0
HRE	HARARE, ZIMBABWE	S	FGN	3314	0	5238	0	5347	0	13899	0
HRG	HORGHADA, ARAB REP OF EGYPT	N	FGN	760	0	732	0	1024	0	2516	0
HRL	HARLINGEN, TX, USA	N	YES	7446	1	7653	0	7583	0	22682	1
HSV	HUNTSVILLE/DECATUR, AL, USA	N	YES	1817	0	1972	0	3316	0	7105	0
HTI	HAMILTON ISLAND, QLD, AUSTRALIA	S	FGN	1351	0	1648	0	1748	0	4747	0
HTS	HUNTINGTON, WV, USA	N	YES	1152	0	1174	0	538	0	2864	0
HUN	HUALIEN, TAIWAN	N	FGN	6508	0	7264	0	8030	0	21802	0
HYD	HYDERABAD, INDIA	N	FGN	2103	1	2214	5	2265	1	6582	7
IAD	DULLES INT'L, WASHINGTON, DC, USA	N	YES	84839	1	52922	1	50660	0	188421	2
IAH	HOUSTON INTERCONT, TX, USA	N	YES	35485	0	46187	1	42713	0	124385	1
IAM	IN AMENAS, ALGERIA	N	FGN	408	0	420	0	506	0	1334	0
IBA	IBADAN, NIGERIA	N	FGN	1382	0	706	0	484	0	2572	0
IBZ	IBIZA, SPAIN	N	FGN	124	1	220	0	294	1	638	2
ICT	WICHITA, KA, USA	N	YES	10698	0	6225	0	6858	0	23781	0
IDA	IDAHO FALLS, ID, USA	N	YES	2190	0	2756	0	2714	0	7660	0
IDR	INDORE, INDIA	N	FGN	1460	0	1426	0	1460	0	4346	0
IEV	KIEV, USSR	N	FGN	0	0	32	0	8	0	40	0
IFN	ISFAHAN, IRAN	N	FGN	2256	0	2874	0	2728	0	7858	0
IGL	IZMIR-CIGLI, TURKEY	N	FGN	26	0	22	0	0	0	48	0
IGR	IGUAZU, ARGENTINA	S	FGN	986	0	784	0	522	0	2292	0
IGU	IGUASSU FALLS, BRAZIL	S	FGN	1776	0	2764	0	3510	0	8050	0
ILG	PHILADELPHIA-WILMINGTON, PA, USA	N	YES	440	0	0	0	0	0	440	0
ILM	WILMINGTON, NC, USA	N	YES	6254	0	5363	0	4298	0	15915	0
ILR	ILORIN, NIGERIA	N	FGN	1568	0	1884	0	737	0	4189	0
IMF	IMPHAL, INDIA	N	FGN	1460	0	1464	0	1460	0	4384	0
IMP	IMPERATRIZ, BRAZIL	S	FGN	1186	0	1464	0	1456	0	4106	0
IND	INDIANAPOLIS, IN, USA	N	YES	12290	0	19730	0	25796	0	57816	0
INI	NIS, YUGOSLAVIA	N	FGN	57	0	0	0	106	0	163	0
JNU	NAURU, REP OF NAURU	S	FGN	889	0	906	1	430	0	2225	1
INZ	IN SALAH, ALGERIA	N	FGN	586	0	504	0	606	0	1696	0
IOA	IOANNINA, GREECE	N	FGN	1354	0	1200	0	1200	0	3754	0
IOS	ILHEUS, BRAZIL	S	FGN	2920	0	2928	0	2954	0	8802	0

AIRPORT	APTDEF	HEMISPHR	CONUS	STGFY87	ING1	STGFY88	ING2	STGFY89	ING3	STG737	INGS
IQQ	IQUIQUE, CHILE	S	FGN	1460	0	1674	0	1868	0	5002	0
IQT	IQUITOS, PERU	S	FGN	210	0	304	0	844	0	1358	0
IRJ	LA RIOJA, ARGENTINA	S	FGN	860	0	768	0	736	0	2364	0
IRP	ISIRO, ZAIRE	N	FGN	104	0	156	0	210	0	470	0
ISA	MOUNT ISA, QLD, AUSTRALIA	S	FGN	546	0	1262	1	1660	0	3468	1
ISB	ISLAMABAD RAWALPINDI, PAKISTAN	N	FGN	3663	0	4673	0	4868	0	13204	0
ISG	ISHIGAKI, JAPAN	N	FGN	6936	1	7473	4	6358	0	20767	5
ISO	KINSTON, NC, USA	N	YES	2024	0	1464	0	495	0	3983	0
ISP	LONG ISLAND MACARTHUR, NY, USA	N	YES	5816	0	3036	0	3539	1	12391	1
IST	ISTANBUL, TURKEY	N	FGN	2551	0	2343	0	3213	0	8107	0
ITH	ITHICA, NY, USA	N	YES	182	0	2	0	151	0	335	0
ITO	HILO HAWAII, HA, USA	N	NO	8568	1	9273	2	9946	0	27787	3
IUE	NIUE ISLAND, NIUE	S	FGN	127	0	72	0	26	0	225	0
IVC	INVERCARGILL, NEW ZEALAND	S	FGN	2069	0	2076	1	2096	0	6241	1
IXA	AGARTALA, INDIA	N	FGN	1976	0	2720	0	2593	0	7289	0
IXB	BAGDOGRA, INDIA	N	FGN	2366	1	2196	0	2190	0	6752	1
IXC	CHANDIGAR, INDIA	N	FGN	1460	0	1464	1	1426	1	4350	2
IXD	ALLAHABAD, INDIA	N	FGN	392	0	500	0	1042	0	1934	0
IXE	MANGALORE, INDIA	N	FGN	2370	0	2168	1	1878	0	6416	1
IXJ	JAMMU, INDIA	N	FGN	1650	0	1576	1	1546	1	4772	2
IXL	LEH, INDIA	N	FGN	574	0	916	0	938	0	2428	0
IXM	MADURAI, INDIA	N	FGN	1200	0	1142	0	1344	0	3686	0
IXR	RANCHI, INDIA	N	FGN	1460	0	1464	1	1460	0	4384	1
IXS	SILOHAR, INDIA	N	FGN	1748	0	1832	0	1772	0	5352	0
IXU	AURANGABAD, INDIA	N	FGN	1820	0	1464	1	1460	0	4744	1
IXV	ALONG, INDIA	N	FGN	0	0	0	1	0	0	0	1
IXZ	PORT BLAIR ANDAMAN ISLAND, INDIA	N	FGN	706	0	928	0	994	0	2628	0
JAC	JACKSON, WY, USA	N	YES	2325	0	2179	0	2342	0	6846	0
JAI	JAIPUR, INDIA	N	FGN	4068	2	4876	2	3736	0	12680	4
JAN	JACKSON, MS, USA	N	YES	3392	0	3085	0	2959	0	9436	0
JAX	JACKSONVILLE, FL, USA	N	YES	10211	0	13077	0	15242	1	38530	1
JDH	JODHPUR, INDIA	N	FGN	2920	0	2928	0	2816	1	8664	1
JDO	JUAZEIRO DO NORTE CEARAH, BRAZIL	S	FGN	626	0	628	0	624	0	1878	0
JED	JEDDAH, SAUDI ARABIA	N	FGN	19745	0	20292	0	19897	0	59934	0
JER	JERSEY CHANNEL ISLANDS, UK	N	FGN	1263	0	1112	0	3011	0	5386	0
JFK	KENNEDY, NEW YORK, NY, USA	N	YES	13217	0	8785	0	8874	0	30876	0
JGA	JAMNAGAR, INDIA	N	FGN	730	0	732	0	730	0	2192	0
JHB	JOHOR BAHRU, MALAYSIA	N	FGN	4018	0	4164	0	4690	0	12872	0
JIB	DJIBOUTI, DJIBOUTI	N	FGN	508	0	686	0	868	0	2062	0
JKH	CHIOS, GREECE	N	FGN	1858	0	1720	0	1768	0	5346	0
JNB	JOHANNESBURG, SOUTH AFRICA	S	FGN	13746	2	15620	0	18693	1	48059	3
JNU	JUNEAU, AS, USA	N	NO	2255	0	2684	0	2686	0	7625	0
JOI	JOINVILLE, BRAZIL	S	FGN	626	0	628	0	624	0	1878	0
JOS	JOS, NIGERIA	N	FGN	2596	0	2022	0	1643	0	6261	0
JPA	JOAO PESSOA, BRAZIL	S	FGN	1460	0	1832	0	4074	0	7366	0
JRH	JORMAT, INDIA	N	FGN	694	2	732	0	730	0	2156	2
JRO	KILIMANJARO, TANZANIA	S	FGN	1667	0	1568	0	1405	0	4640	0
JSI	SKIATHOS, GREECE	N	FGN	412	0	342	0	448	0	1202	0
JTR	SANTORINI, THIRA ISLAND, GREECE	N	FGN	1126	0	884	0	1480	0	3490	0
JUB	JUBA, SUDAN	N	FGN	38	0	0	0	0	0	38	0
JUJ	JUJUY, ARGENTINA	S	FGN	600	0	226	0	26	0	852	0
KAD	KADUNA, NIGERIA	N	FGN	3896	0	3639	0	2650	0	10185	0
KAN	KANO, NIGERIA	N	FGN	700	0	708	0	765	0	2173	0
KBL	KABUL, AFGHANISTAN	N	FGN	208	0	208	0	78	0	494	0
KBR	KOTA BHARU, MALAYSIA	N	FGN	3024	0	3034	0	3091	0	9149	0
KCH	KUCHING, SARAWAK, MALAYSIA	N	FGN	5337	1	5482	0	6265	0	17084	1
KCZ	KOCHI, JAPAN	N	FGN	1522	0	816	0	170	0	2508	0
KDU	SKARDU, PAKISTAN	N	FGN	190	0	688	0	730	0	1608	0
KEF	REYKJAVIK-KEFLAVIK, ICELAND	N	FGN	561	0	936	0	992	1	2489	1
KER	KERMAN, IRAN	N	FGN	532	0	52	0	0	0	584	0
KGA	KANANGA, ZAIRE	S	FGN	420	0	366	0	490	0	1276	0
KGL	KIGALI, RWANDA	S	FGN	22	0	22	0	208	0	252	0
KGS	KOS, GREECE	N	FGN	550	1	566	0	894	0	2010	1
KHH	KAOSHIUNG, TAIWAN	N	FGN	14596	2	18764	0	20170	0	53530	2
KHI	KARACHI, PAKISTAN	N	FGN	7384	2	9030	0	8710	1	25124	3
KHN	NANCHANG KIANGSI, P. R. CHINA	N	FGN	228	0	190	0	52	0	470	0
KIJ	NIIGATA, JAPAN	N	FGN	2190	0	2224	0	2162	0	6576	0
KIM	KIMBERLEY, SOUTH AFRICA	S	FGN	3888	0	4182	0	4789	3	12859	3
KIN	KINGSTON, JAMAICA	N	FGN	338	0	88	0	208	0	634	0
KKC	KHON KAEN, THAILAND	N	FGN	2264	0	1942	0	1668	0	5874	0
KLX	KALAMATA, GREECE	N	FGN	782	0	742	0	730	0	2254	0
KMG	KUNMING, P.R. CHINA	N	FGN	2448	1	2577	0	3683	0	8708	1
KMI	MIYAZAKI, JAPAN	N	FGN	4686	0	3536	0	3474	0	11696	0
KMJ	KUMAMOTO, JAPAN	N	FGN	0	0	74	0	42	0	116	0
KMP	KEETMANSHOOP, NAMIBIA	S	FGN	174	0	0	0	0	0	174	0

AIRPORT	APTDEF	HEMISPHR	CONUS	STGFY87	ING1	STGFY88	ING2	STGFY89	ING3	STG737	INGS
KMQ	KOMATSU, JAPAN	N	FGN	730	0	828	0	702	0	2260	0
KMX	KHAMIS MUSHAIT, SAUDI ARABIA	N	FGN	0	0	0	0	322	0	322	0
KND	KINDU, ZAIRE	S	FGN	480	0	622	0	522	0	1624	0
KNN	KANKAN, GUINEA	N	FGN	0	0	100	0	92	0	192	0
KNU	KANPUR, INDIA	N	FGN	1372	0	1578	0	1068	0	4018	0
KOA	KONA, HA, USA	N	NO	11308	0	11047	1	13819	0	36174	1
KOJ	KAGOSHIMA, JAPAN	N	FGN	843	0	1913	2	1095	0	3851	2
KRN	KIRUNA, SWEDEN	N	FGN	0	0	18	0	0	0	18	0
KRP	KARUP, DENMARK	N	FGN	0	0	0	0	72	0	72	0
KRS	KRISTIANSAND, NORWAY	N	FGN	7646	0	7990	0	7912	0	23548	0
KRT	KHARTOUM, SUDAN	N	FGN	1921	0	2623	1	1945	0	6489	1
KSA	KOSRAE, CAROLINE ISLANDS	N	FGN	10	0	132	0	104	0	246	0
KSD	KARLSTAD, SWEDEN	N	FGN	0	0	0	0	52	0	52	0
KSH	BAKHTARAN, IRAN	N	FGN	0	0	0	0	144	0	144	0
KSM	ST MARY'S, AS, USA	N	NO	420	0	562	0	722	0	1704	0
KST	KOSTI, SUDAN	N	FGN	0	1	0	0	0	0	0	1
KSU	KRISTIANSUND, NORWAY	N	FGN	2128	0	2024	0	2106	0	6258	0
KTM	KATHMANDU, NEPAL	N	FGN	2240	0	2200	1	2195	0	6635	1
KTN	KETCHIKAN, AS, USA	N	NO	1460	0	1464	0	1460	0	4384	0
KUA	KUANTAN, MALAYSIA	N	FGN	426	0	420	0	676	0	1522	0
KUH	KUSHIRO, JAPAN	N	FGN	1336	0	926	0	552	0	2814	0
KUL	KUALA LUMPUR, MALAYSIA	N	FGN	21147	1	22237	0	24379	0	67763	1
KVA	KAVALA, GREECE	N	FGN	1242	0	1160	0	1202	0	3604	0
KWE	GUIYANG, P. R. CHINA	N	FGN	684	0	660	0	834	0	2178	0
KWI	KUWAIT, KUWAIT	N	FGN	3659	0	2728	0	2536	0	8923	0
KWJ	KWANGJU, REP OF KOREA	N	FGN	0	0	0	0	668	0	668	0
KWL	GUILIN, P. R. CHINA	N	FGN	3855	0	4671	0	3365	0	11891	0
LAD	LUANDA, ANGOLA	S	FGN	5680	0	5112	0	3986	0	14778	0
LAN	LANSING, MI, USA	N	YES	1120	0	1646	0	1764	0	4530	0
LAS	LAS VEGAS, NV, USA	N	YES	82033	0	89149	1	96139	0	267321	1
LAX	LOS ANGELES, CA, USA	N	YES	113329	0	123390	2	118819	4	355538	6
LBB	LUBBOCK, TX, USA	N	YES	13600	0	16396	0	16240	0	46236	0
LBU	LABUAN SABAH, MALAYSIA	N	FGN	2398	0	2406	0	2709	0	7513	0
LBV	LIBREVILLE, GABON	N	FGN	1553	0	1955	0	1983	0	5491	0
LCA	LARNACA, CYPRUS	N	FGN	1352	0	1277	0	1616	1	4245	1
LCE	LA CEIBA, HONDURAS	N	FGN	380	0	570	0	1210	0	2160	0
LDB	LONDRIANA, BRAZIL	S	FGN	0	0	440	0	1185	0	1625	0
LDE	LOURDES/TARBES, FRANCE	N	FGN	8	1	0	1	0	1	8	3
LDI	LINDI, TANZANIA	S	FGN	10	0	0	0	0	0	10	0
LED	LENINGRAD, U.S.S.R.	N	FGN	198	0	163	0	239	0	600	0
LEI	ALMERIA, SPAIN	N	FGN	100	0	104	0	130	0	334	0
LEJ	LEIPZIG, GDR	N	FGN	16	0	28	0	46	0	90	0
LEX	LEXINGTON, KY, USA	N	YES	3916	1	4165	0	3573	0	11654	1
LFT	LAFAYETTE, LA, USA	N	YES	0	0	0	0	302	0	302	0
LFW	LOME, TOGO	N	FGN	985	0	812	0	929	0	2726	0
LGA	NEW YORK LA GUARDIA, NY, USA	N	YES	32068	1	32703	1	36226	1	100997	3
LGB	LONG BEACH, CA, USA	N	YES	1299	0	3321	0	7605	0	12225	0
LGG	LIEGE, BELGIUM	N	FGN	0	0	0	0	0	1	0	1
L GK	LANGKAWI, MALAYSIA	N	FGN	0	0	206	0	448	0	654	0
L GW	LONDON-GATWICK, ENGLAND	N	FGN	13117	0	17634	1	36365	2	67116	3
L HE	LAHORE, PAKISTAN	N	FGN	7188	1	9191	2	9169	0	25548	3
L HR	LONDON HEATHROW, ENGLAND, (UK)	N	FGN	69405	2	75934	1	93470	2	238809	5
L HW	LANZHOU, P. R. CHINA	N	FGN	0	0	83	0	21	0	104	0
L IH	LINUE, KAUAI, HA, USA	N	NO	17365	2	17708	3	19247	3	54320	8
L IL	LILLE, FRANCE	N	FGN	214	0	292	0	367	0	873	0
L IM	LIMA, PERU	S	FGN	1460	0	2157	0	2318	0	5935	0
L IN	MILAN Linate, ITALY	N	FGN	7588	1	7604	1	7641	0	22833	2
L IS	LISBON, PORTUGAL	N	FGN	10558	0	13190	0	14480	0	38228	0
L IT	LITTLE ROCK, AK, USA	N	YES	10791	1	10853	1	9382	1	31026	3
L JA	LODJA, ZAIRE	S	FGN	106	0	104	0	74	0	284	0
L JU	LJUBLJANA, YUGOSLAVIA	N	FGN	1741	0	1704	1	1615	0	5060	1
L KO	LUCKNOW, INDIA	N	FGN	4396	1	4264	1	4236	2	12896	4
L LA	LULEA, SWEDEN	N	FGN	0	0	8	0	0	0	8	0
L LW	LILONGWE, MALAWI	S	FGN	752	1	786	0	823	0	2361	1
L MT	KLAMATH FALLS, OR, USA	N	YES	1218	0	62	0	0	0	1280	0
L NK	LINCOLN, NB, USA	N	YES	5816	0	5847	0	4201	0	15864	0
L NZ	LONZ, AUSTRIA	N	FGN	768	1	704	0	683	0	2155	1
L OS	LAGOS, NIGERIA	N	FGN	16716	1	14969	1	11299	0	42984	2
L PA	GRAN CANARIA, CANARY ISLANDS	N	FGN	293	0	1439	0	2682	1	4414	1
L PB	LA PAZ, BOLIVIA	S	FGN	136	0	264	0	312	0	712	0
L PL	LIVERPOOL, ENGLAND	N	FGN	30	0	42	0	134	0	206	0
L RH	LA ROCHELLE, FRANCE	N	FGN	0	0	8	0	4	0	12	0
L ST	LAUNCESTON, TASMANIA, AUSTRALIA	S	FGN	4721	1	5684	0	5723	2	16128	3
L TN	LONDON-LUTON INT'L, ENGLAND	N	FGN	192	0	270	0	556	1	1018	1
L UN	LUSAKA, ZAMBIA	S	FGN	2302	0	1961	0	2183	0	6446	0

AIRPORT	APTDEF	HEMISPHR	CONUS	STGFY87	ING1	STGFY88	ING2	STGFY89	ING3	STG737	INGS
LUO	LUENA, ANGOLA	S	FGN	434	0	472	0	556	0	1462	0
LUQ	SAN LUIS, ARGENTINA	S	FGN	196	0	0	0	0	0	196	0
LUT	LAURA STATION, AUSTRALIA	S	FGN	0	0	0	0	0	0	0	0
LUX	LUXEMBOURG, LUXEMBOURG	N	FGN	2615	0	3500	0	3753	0	9868	0
LXR	LUXOR, ARAB REP OF EGYPT	N	FGN	2161	0	2143	1	2995	0	7299	1
LXS	LEMNOS, GREECE	N	FGN	1040	0	996	0	1060	1	3096	1
LYH	LYNCHBURG, VA, USA	N	YES	1824	0	2306	0	1754	0	5884	0
LYP	FAISALABAD, PAKISTAN	N	FGN	790	0	1326	0	1324	0	3440	0
LYR	LONGYEARBYEN, NORWAY	N	FGN	14	0	223	0	255	0	492	0
LYS	LYON, FRANCE	N	FGN	5223	0	5439	0	5714	0	16376	0
MAA	MADRAS, INDIA	N	FGN	7714	0	8485	3	8067	1	24266	4
MAB	MARABA, BRAZIL	S	FGN	470	0	628	0	782	0	1880	0
MAD	MADRID, SPAIN	N	FGN	6813	1	7477	0	9134	0	23424	1
MAF	MIDLAND ODESSA, TX, USA	N	YES	16021	1	14942	0	14184	2	45147	3
MAH	MAHON, MENORCA, SPAIN	N	FGN	84	0	174	0	310	1	568	1
MAJ	MAJURO, MARSHALL ISLAND	N	FGN	92	0	132	0	104	0	323	0
MAL	MANGOLE, INDONESIA	N	FGN	0	0	0	0	0	0	0	0
MAN	MANCHESTER, ENGLAND (UK)	N	FGN	5780	3	7490	1	10909	0	24179	4
MAO	MANAUS, BRAZIL	S	FGN	6627	0	7820	0	9619	0	24066	0
MBA	MOMBASA, KENYA	S	FGN	0	0	0	0	21	0	21	0
MBJ	MORTEGO BAY, JAMAICA	N	FGN	218	0	0	0	0	0	218	0
MBS	SAGINAW, MI, USA	N	YES	794	0	272	0	2169	0	3235	0
MBX	MARIBOR, YUGOSLAVIA	N	FGN	0	0	0	0	40	0	40	0
MCG	MCGRATH, AS, USA	N	NO	0	0	0	0	204	0	204	0
MCI	KANSIS CITY, MO, USA	N	YES	26453	0	29842	0	50786	0	107081	0
MCO	ORLANDO-INT'L, FL, USA	N	YES	23551	1	28187	0	25069	0	76807	1
MCP	MACAPA, AMAPA, BRAZIL	N	FGN	1888	0	2337	0	2295	0	6520	0
MCT	MUSCAT, OMAN	N	FGN	4409	0	5241	0	5174	0	14824	0
MCY	MAROOCHYDORE, QLD, AUSTRALIA	S	FGN	104	0	136	0	10	0	250	0
MCZ	MACEIO, ALAGOAS, BRAZIL	S	FGN	978	0	1646	0	4088	0	6712	0
MDE	MEDELLIN, COLOMBIA	N	FGN	312	0	312	0	314	0	938	0
MDI	MAKURDI, NIGERIA	N	FGN	730	0	695	0	375	0	1800	0
MDK	MBANDAKA, ZAIRE	N	FGN	416	0	522	0	526	0	1464	0
MDP	MINDIPTANA, INDONESIA	-0-	FGN	0	0	0	0	0	1	0	1
MDQ	MAR DEL PLATA, ARGENTINA	S	FGN	2964	0	2816	2	2662	1	8442	3
MDT	HARRISBURG-OLMSTEAD ST, PA, USA	N	YES	3784	1	3265	0	2805	0	9854	1
MDW	CHICAGO-MIDWAY, IL, USA	N	YES	33077	2	46544	2	49337	1	128958	5
MDZ	MENDOZA, ARGENTINA	S	FGN	1578	0	1106	0	886	0	3570	0
MED	MEDINA, SAUDI ARABIA	N	FGN	4698	0	5236	0	4896	1	14830	1
MEG	MALANGE, ANGOLA	S	FGN	740	0	758	0	696	0	2194	0
MEL	MELBOURNE, VICTORIA, AUSTRALIA	S	FGN	17124	1	21097	3	31383	0	69604	4
MEM	MEMPHIS, TN, USA	N	YES	8599	0	7534	0	7035	0	23168	0
MES	MEDAN, INDONESIA	N	FGN	730	0	732	0	714	0	2176	0
MEX	MEXICO CITY, MEXICO	N	FGN	4170	0	5281	0	5092	0	14543	0
MFE	MC ALLEN, TX, USA	N	YES	288	0	1148	0	1052	0	2488	0
MFR	MEDFOR, OR, USA	N	YES	3529	0	2228	1	1784	0	7541	1
MFU	MFUME, ZAMBIA	S	FGN	34	0	60	0	30	0	124	0
MGA	MANAGUA, NICARAGUA	N	FGN	3212	0	2689	0	1762	1	7663	1
MGM	MONTGOMERY, AL, USA	N	YES	148	0	896	0	1681	0	2725	0
MGO	MOGADISHU, SOMALIA	N	FGN	94	0	46	0	50	0	190	0
MHD	MASHAD, IRAN	N	FGN	516	0	0	0	0	0	516	0
MHT	MANCHESTER, NH, USA	N	YES	0	0	1106	0	2733	0	3839	0
MIA	MIAMI, FL, USA	N	YES	28033	0	34912	1	29373	0	92318	1
MID	MERIDA, MEXICO	N	FGN	0	0	244	0	170	0	414	0
MIL	MILAN, ITALY	N	FGN	0	1	0	0	0	0	0	1
MIR	MONASTIR, TUNISIA	N	FGN	488	0	336	0	567	0	1391	0
MIU	MAIDUGURI, NIGERIA	N	FGN	887	0	1042	0	636	0	2565	0
MJM	MBUJI-MAYI, ZAIRE	S	FGN	364	0	510	0	618	0	1492	0
MJN	MAJUNGA, MADAGASCAR	S	FGN	402	0	336	0	298	0	1036	0
MJT	MYTILENE, GREECE	N	FGN	2852	0	2634	0	2820	0	8306	0
MKE	MILWAUKEE, WI, USA	N	YES	1056	0	3124	0	4861	0	9041	0
MKY	MALACCA, MALAYSIA	S	FGN	2109	0	2272	0	1316	0	5697	0
MLA	MALTA, MEDITERRANEAN SEA	N	FGN	2882	0	4492	0	5117	1	12491	1
MLB	MELBOURNE, FL, USA	N	YES	958	0	1474	0	1034	0	3466	0
MLE	MALE, MALDIVES	N	FGN	356	0	464	0	454	0	1274	0
MLH	MULHOUSE/BASEL, FRANCE	N	FGN	1	0	4	0	21	0	26	0
MLI	MOLINE, IL, USA	N	YES	1947	0	2284	0	2941	0	7172	0
MLU	MONROE, LA, USA	N	YES	3670	0	3712	0	2852	0	10234	0
MLW	MONROVIA, LIBERIA	N	FGN	0	0	0	0	124	0	124	0
MMY	MIYAKO JIMA, JAPAN	N	FGN	3606	5	4836	5	3834	0	12276	10
MNL	MANILA, PHILIPPINES	N	FGN	1232	0	1211	0	1321	0	3764	0
MOB	MOBILE AL/PASCAGOULA, MS, USA	N	YES	3013	0	2274	0	330	0	5617	0
MOC	MONTES CLAROS, BRAZIL	S	FGN	416	0	420	0	416	0	1252	0
MOL	MOLDE, NORWAY	N	FGN	2129	0	2263	0	2366	0	6758	0
MOQ	MORONDAVA, MADAGASCAR	S	FGN	112	0	204	0	150	0	466	0

AIRPORT	APTDEF	HEMISPHR	CONUS	STGFY87	ING1	STGFY88	ING2	STGFY89	ING3	STG737	INGS
MOT	MINOT, ND, USA	N	YES	737	0	964	0	648	0	2349	0
MPL	MONTPELLIER, FRANCE	N	FGN	52	0	52	0	52	0	156	0
MPM	MAPUTO, MOZAMBIQUE	S	FGN	2248	0	2289	0	1480	0	6017	0
MRS	MARSEILLE, FRANCE	N	FGN	3381	0	3805	0	4186	0	11372	0
MRU	MAURITIUS, MAURITIUS	S	FGN	321	0	437	0	446	0	1204	0
MRY	MONTEREY, CA, USA	N	YES	3559	0	1923	0	1844	0	7326	0
MSN	MADISON, WI, USA	N	YES	1655	0	1489	0	2132	0	5316	0
MSO	MISSOULA, MT, USA	N	YES	3537	1	3427	0	3307	0	10271	1
MSP	MINNEAPOLIS-ST PAUL, MN, USA	N	YES	8120	1	11799	0	16476	0	36395	1
MSR	MUENSTER, FRG	N	FGN	4	0	0	0	0	0	4	0
MSY	NEW ORLEANS, LA, USA	N	YES	25950	0	32656	1	32966	3	91572	4
MSZ	NAMIBE, ANGOLA	S	FGN	228	0	262	0	138	0	628	0
MTS	MANZINI, SWAZILAND	S	FGN	96	0	192	0	154	0	442	0
MTY	MONTERREY, MEXICO	N	FGN	0	0	62	0	48	0	110	0
MUC	MUNICH, FRG	N	FGN	36435	4	44305	1	46990	1	127730	6
MUX	MULTAN, PAKISTAN	N	FGN	2488	0	2344	0	2303	0	7135	0
MUZ	MUSOMA, TANZANIA	S	FGN	8	0	0	0	0	0	8	0
MVB	FRANCEVILLE, GABON	N	FGN	1	0	5	0	3	0	9	0
MVD	MONTVIDEO, URUGUAY	S	FGN	4977	0	5351	0	5226	0	15554	0
MVR	MAROUA, REP OF CAMEROON	N	FGN	1190	0	1052	0	933	0	3175	0
MWZ	MWANZA, TANZANIA	S	FGN	79	0	530	0	785	0	1394	0
MXP	MILAN-MALPENSA, ITALY	N	FGN	4	0	21	1	26	0	51	1
MXZ	MEIXIAN, P. R. CHINA	N	FGN	0	0	328	0	420	0	748	0
MYJ	MATSUYAMA, SHIKIKU, JAPAN	N	FGN	290	0	862	0	762	0	1914	0
MYR	MYRTLE BEACH, SC, USA	N	YES	4864	0	5504	0	6440	1	16808	1
MYW	MTWARA, TANZANIA	S	FGN	370	0	312	0	290	0	972	0
MYY	MIRI, SARAWAK, MALAYSIA	N	FGN	3024	0	3244	0	3730	0	9998	0
MZG	MAKUNG, TAIWAN	N	FGN	8877	0	10980	0	10180	0	30037	0
MZM	METZ, FRANCE	N	FGN	0	0	0	0	21	0	21	0
MZI	MAZATLAN, MEXICO	N	FGN	976	0	554	0	628	0	2158	0
NAG	NAGPUR, INDIA	N	FGN	2756	0	2440	0	1970	0	7166	0
NAK	NAKHON RATCHASIMA, THAILAND	N	FGN	0	0	0	0	82	0	82	0
NAN	NADI, FIJI	S	FGN	1373	0	1413	0	1724	0	4510	0
NAP	NAPLES, ITALY	N	FGN	739	0	584	0	662	0	1985	0
NAS	NASSAU, BAHAMAS	N	FGN	7440	0	9851	0	10501	0	27792	0
NAT	NATAL, BRAZIL	S	FGN	4380	0	4976	0	5422	0	14778	0
NBO	NAIROBI, KENYA	S	FGN	1051	0	1087	0	1344	0	3482	0
NCE	NICE, FRANCE	N	FGN	3675	1	5258	0	5599	0	14532	1
NCL	NEWCASTLE, ENGLAND	N	FGN	1825	0	1589	1	1879	0	5293	1
NDD	SUMBE, ANGOLA	S	FGN	10	0	0	0	0	0	10	0
NDJ	N'DJAMENA, CHAD	N	FGN	18	0	0	0	20	0	38	0
NGE	N'GAOUNDERE, REP OF CAMEROON	N	FGN	1006	0	902	0	870	0	2778	0
NGO	NAGOYA, JAPAN	N	FGN	5577	0	6995	1	6550	0	19122	1
NIM	NIAMEY, NIGER	N	FGN	62	0	0	0	0	0	62	0
NKC	NOUAKCHOTT, MAURITANIA	N	FGN	110	0	82	0	66	0	258	0
NKG	NANJING, P. R. CHINA	N	FGN	2476	0	2744	0	3005	0	8225	0
NLA	NDOLA, ZAMBIA	S	FGN	701	0	508	0	730	0	1939	0
NLK	NORFOLK ISLAND, PACIFIC OCEAN	S	FGN	420	0	581	0	628	0	1629	0
NNG	NANNING, P. R. CHINA	N	FGN	1157	0	1042	0	480	0	2679	0
NOS	NOSSIBE, MADAGASCAR	S	FGN	508	0	614	0	700	0	1822	0
NOU	NOUMEA, NEW CALEDONIA	S	FGN	219	0	209	0	949	0	1377	0
NOV	HUAMBO, ANGOLA	S	FGN	520	0	630	0	1254	0	2404	0
NPE	NAPIER, NEW ZEALAND	S	FGN	0	0	0	0	80	0	80	0
NQN	NEUQUEN, ARGENTINA	S	FGN	1876	0	1838	0	1598	0	5312	0
NRT	TOKYO-NARITA, JAPAN	N	FGN	0	0	640	0	730	0	1370	0
NUE	NUREMBURG, FRG	N	FGN	3516	1	4068	1	3943	1	11527	3
NVT	NAVEGANTES, BRAZIL	S	FGN	2608	0	2556	0	2500	0	7664	0
OAJ	JACKSONVILLE, NC, USA	N	YES	2428	0	1892	0	1588	0	5908	0
OAK	OAKLAND, SAN FRANCISCO, CA, USA	N	YES	27453	3	25240	0	24777	0	77470	3
ODE	ODENSE, DENMARK	N	FGN	567	0	496	0	503	0	1566	0
OGG	KAHULUI, MAUI, HA, USA	N	NO	27942	1	27757	1	29505	0	85204	2
OGN	YONAGUNI-JIMA, JAPAN	N	FGN	0	0	30	0	0	0	30	0
OGX	OUARGLA, ALGERIA	N	FGN	836	0	552	0	841	0	2229	0
OHD	OHRIID, YUGOSLAVIA	N	FGN	292	0	523	0	452	0	1267	0
OIT	OITA, JAPAN	N	FGN	854	0	818	0	1472	1	3144	1
OKA	OKINAWA, RYUKYU IS, JAPAN	N	FGN	11818	0	13972	0	13660	0	39450	0
OKC	OKLAHOMA CITY, OK, USA	N	YES	25165	0	27072	1	26161	1	78398	2
OKJ	OKAJAMA, JAPAN	N	FGN	0	0	923	0	1444	0	2367	0
OLB	OLBIA, ITALY	N	FGN	40	0	42	0	92	0	174	0
OMA	OMAHA, NB, USA	N	YES	10800	0	10871	0	13689	0	35360	0
OME	NOME, AS, USA	N	NO	2272	0	2232	0	2269	0	6773	0
OMO	MOSTAR, YUGOSLAVIA	N	FGN	0	0	0	0	178	0	178	0
ONT	ONTARIO, CA, USA	N	YES	33033	0	34539	0	35608	0	103180	0
OOL	GOLD COAST, QLD, AUSTRALIA	S	FGN	2812	0	3663	0	5208	0	11683	0
OPO	OPORTO, PORTUGAL	N	FGN	3349	1	3331	0	5553	0	12233	1

AIRPORT	APTDEF	HEMISP	CONUS	STGFY87	ING1	STGFY88	ING2	STGFY89	ING3	STG737	INGS
ORD	CHICAGO-O'HARE, IL, USA	N	YES	59542	2	79401	3	110094	1	249037	6
ORF	NORFOLK-VA. BEACH, VA, USA	N	YES	24618	2	20845	0	19290	3	64753	5
ORH	WORCESTER, MA, USA	N	YES	719	0	2976	0	1966	0	5661	0
ORK	CORK, IRELAND	N	FGN	2942	0	3322	0	4963	0	11227	0
ORN	ORAN, ALGERIA	N	FGN	4524	0	4495	0	4450	0	13469	0
ORY	PARIS - ORLY ARPT, FRANCE	N	FGN	6940	1	8806	1	9381	2	25127	4
OSA	OSAKA, JAPAN	N	FGN	1792	0	1262	0	1246	0	4300	0
OSD	OSTERSUND, SWEDEN	N	FGN	0	0	0	0	6	0	6	0
OSL	OSLO, NORWAY	N	FGN	14168	0	0	0	0	0	14168	0
OSM	MOSUL, IRAQ	N	FGN	312	0	314	0	314	0	940	0
OTP	BUCHAREST-OTOPENI, ROMANIA	N	FGN	487	0	405	0	481	0	1373	0
OTZ	KOTZEBUE, AS, USA	N	NO	2082	0	2050	0	2082	0	6214	0
OJA	OJAGADOUGOU, BURKINA FASO	N	FGN	14	0	0	0	0	0	14	0
OUJ	OJDA, MOROCCO	N	FGN	402	0	386	0	361	0	1149	0
OUE	OUESSO, PEOP REP OF CONGO	N	FGN	258	0	260	0	222	0	740	0
OZZ	OUARAZATE, MOROCCO	N	FGN	161	0	395	0	385	0	941	0
PAP	PORT AU PRINCE, HAITI	N	FGN	0	0	88	0	208	0	296	0
PAT	PATNA, INDIA	N	FGN	4973	2	4408	3	3842	0	13223	5
PBI	WEST PALM BEACH, FL, USA	N	YES	10310	0	9469	0	9081	0	28860	0
PBM	PARAMARIBO, REP OF SURINAME	N	FGN	104	0	106	0	104	0	314	0
PCL	PUCALLPA, PERU	S	FGN	586	0	110	0	182	0	878	0
PDB	PEDRO BAY, AS, USA	N	NO	0	0	0	0	0	1	0	1
PDL	PONTA DELGADA, PORTUGAL (AZORES)	N	FGN	886	0	933	0	451	0	2270	0
PDP	PUNTA DEL ESTE, URUGUAY	S	FGN	2332	0	1676	0	1863	0	5871	0
PDX	PORTLAND, OR, USA	N	YES	18968	3	17604	0	18875	1	55447	4
PEK	BEIJIN, P. R. CHINA	N	FGN	9169	2	9152	0	8951	0	27272	2
PEM	PUERTO MALDONADO, PERU	S	FGN	0	0	92	0	64	0	156	0
PEN	PENANG, MALAYSIA	N	FGN	9062	2	9591	0	10330	0	28983	2
PER	PERTH, WA, AUSTRALIA	S	FGN	1178	0	1503	0	3664	0	6345	0
PEW	PESHAWAR, PAKISTAN	N	FGN	418	0	440	0	578	0	1436	0
PHC	PORT HARCOURT, NIGERIA	N	FGN	208	0	707	0	821	0	1736	0
PHE	PORT HEDLAND, WA, AUSTRALIA	S	FGN	130	0	0	0	0	0	130	0
PHL	PHILADELPHIA/WILMINGTON, PA, USA	N	YES	34184	0	45759	2	45635	2	125578	4
PHS	PHITSANULOK, THAILAND	N	FGN	1460	0	1464	0	818	0	3742	0
PHX	PHOENIX, AZ, USA	N	YES	163588	0	177325	0	199769	1	540682	1
PIA	PEORIA, IL, USA	N	YES	389	0	603	0	993	0	1985	0
PIE	TAMPA-ST. PETERSBURG, FL, USA	N	YES	302	3	0	0	343	1	645	4
PIK	GLASGOW-PRESTWICK, SCOTLAND	N	FGN	52	0	104	0	97	0	253	0
PIT	PITTSBURGH, PA, USA	N	YES	69413	0	80005	0	65047	0	214465	0
PIU	PIURA, PERU	S	FGN	1068	0	62	0	338	0	1468	0
PLZ	PORT ELIZABETH, SOUTH AFRICA	S	FGN	12531	1	14399	2	13797	3	40727	6
PMA	PEMBA ISLAND, TANZANIA	S	FGN	8	0	0	0	0	0	8	0
PMC	PUERTO MONTT, CHILE	S	FGN	1400	0	1565	0	1861	0	4826	0
PME	PORTSMOUTH, UK	N	FGN	0	0	0	2	0	0	0	2
PMI	PALMA MALLORCA ISLAND, SPAIN	N	FGN	2449	0	3158	0	6948	1	12555	1
PMO	PALERMO, ITALY	N	FGN	0	0	46	0	246	0	292	0
PMR	PALMERSTON, NEW ZEALAND	S	FGN	2592	2	2752	0	2694	0	8038	2
PNA	PAMPLONA, SPAIN	N	FGN	0	0	0	0	0	1	0	1
PNQ	POONA, INDIA	N	FGN	842	0	1554	0	1968	0	4364	0
PNR	POINTE NOIRE, PEOP REP OF CONGO	S	FGN	1265	0	912	0	640	0	2817	0
PNS	PENSACOLA, FL, USA	N	YES	2180	0	1824	0	1328	0	5332	0
PNZ	PETROLINA, BRAZIL	S	FGN	720	0	732	0	732	0	2184	0
POA	PORTO ALEGRE, BRAZIL	S	FGN	8156	0	7765	0	5217	0	21138	0
POG	PORT GENTIL, GABON	S	FGN	18	0	139	0	263	0	420	0
POL	PEMBA, MOZAMBIQUE	S	FGN	260	0	262	0	150	0	672	0
POS	PORT OF SPAIN, TRINIDAD/TOBAGO	N	FGN	52	0	52	0	52	0	156	0
PPG	PAGO PAGO, SAMOA	S	FGN	434	0	147	0	26	0	607	0
PPP	PROSERPINE, QLD, AUSTRALIA	S	FGN	437	0	521	0	257	0	1215	0
PPT	PAPEETE, SOCIETY IS, FR POLYNESIA	S	FGN	0	0	0	0	51	0	51	0
PRG	PRAGUE, CZECHOSLOVAKIA	N	FGN	1231	0	1148	0	1510	0	3889	0
PSA	PISA, ITALY	N	FGN	1082	0	1026	1	458	0	2566	1
PSC	PASCO, WA, USA	N	YES	864	0	2035	0	2565	0	5464	0
PSG	PETERSBURG, AS, USA	N	NO	1460	0	1464	0	1460	0	4384	0
PSI	PASNI, PAKISTAN	N	FGN	208	0	208	0	210	0	626	0
PSP	PALM SPRINGS, CA, USA	N	YES	3083	0	3434	0	3653	0	10170	0
PSS	POSADAG, ARGENTINA	S	FGN	938	0	928	0	810	0	2676	0
PTY	PANAMA CITY, PANAMA	N	FGN	2683	0	2922	1	3258	0	8863	1
PUB	PUEBLO, CO, USA	N	YES	2569	0	2395	0	2190	0	7154	0
PUQ	PUNTA ARENAS, CHILE	S	FGN	760	0	782	0	827	0	2369	0
PUS	PUSAN, REP OF KOREA	N	FGN	0	0	0	0	1704	0	1704	0
PUY	PULA, YUGOSLAVIA	N	FGN	76	0	286	0	400	1	762	1
PVD	PROVIDENCE, RI, USA	N	YES	5358	0	7982	0	10925	1	24265	1
PVH	PORTO VELHO, BRAZIL	S	FGN	4700	0	4786	1	4888	1	14374	2
PVK	PREVEZA/LEFKAS, GREECE	N	FGN	0	0	0	0	0	0	0	0
PVR	PUERTO VALLARTA, MEXICO	N	FGN	880	0	888	0	540	0	2308	0

AIRPORT	APTDEF	HEMISPHR	CONUS	STGFY87	ING1	STGFY88	ING2	STGFY89	ING3	STG737	INGS
PWM	PORTLAND, ME, USA	N	YES	2450	0	3650	0	6679	0	12779	0
PXO	PORTO SANTO, PORTUGAL (MADEIRA)	N	FGN	58	0	78	0	102	0	238	0
PZO	PUERTO ORDAZ, VENEZUELA	N	FGN	0	0	0	0	74	0	74	0
PZU	PORT SUDAN, SUDAN	N	FGN	925	0	1517	0	1344	0	3786	0
QTV	TREVISO, ITALY	N	FGN	0	0	0	1	0	0	0	1
RAE	ARAR, SAUDI ARABIA	N	FGN	1662	0	1576	0	1728	0	4966	0
RAH	RAFHA, SAUDI ARABIA	N	FGN	166	0	210	0	240	0	616	0
RAJ	RAJKOT, INDIA	N	FGN	730	0	732	0	692	0	2154	0
RAK	MARRAKECH, MOROCCO	N	FGN	529	0	777	0	1086	0	2392	0
RAP	RAPID CITY, SD, USA	N	YES	4703	1	2847	0	3554	0	11104	1
RAR	RAROTONGA, COOK ISLAND, S. PACIFIC	S	FGN	152	0	63	0	0	0	215	0
RAS	RASHT, IRAN	N	FGN	540	0	40	0	0	0	580	0
RBA	RABAT, MOROCCO	N	FGN	0	0	562	0	531	0	1093	0
RBR	RIO BRANCO, BRAZIL	S	FGN	3614	0	3146	0	3146	0	9906	0
RCU	RIO CUARTO, ARGENTINA	S	FGN	552	0	0	0	0	0	552	0
RDD	REDDING, CA, USA	N	YES	3151	0	737	0	0	0	3888	0
RDU	RALEIGH-DURHAM, NC, USA	N	YES	23607	0	20624	0	16416	0	60647	0
REC	RECIFE, BRAZIL	S	FGN	8974	0	11088	1	15588	0	35650	1
REL	TRELEW, ARGENTINA	S	FGN	2448	0	1928	0	1984	0	6360	0
RES	RESISTENCIA, ARGENTINA	S	FGN	730	0	556	2	752	0	2038	2
RGA	RIO GRANDE, ARGENTINA	S	FGN	1628	0	1278	0	1253	0	4159	0
RGL	RIO GALLEGOS, ARGENTINA	S	FGN	3170	0	2492	0	1838	0	7500	0
RGN	RANGOON, BURMA	N	FGN	0	0	0	0	44	0	44	0
RHO	RHODES, GREECE	N	FGN	728	0	1132	0	2254	0	4114	0
RIC	RICHMOND, VA, USA	N	YES	8252	0	9847	0	9821	0	27920	0
RIJ	RIOJA, PERU	S	FGN	338	0	600	0	192	0	1130	0
RIY	RIYAN, YEMEN	N	FGN	560	0	322	0	242	0	1124	0
RJK	RIJEKA, YUGOSLAVIA	N	FGN	76	0	370	0	378	0	824	0
RKT	RAS AL KHAIMAH, U. A. EMIRATES	N	FGN	236	0	237	0	238	0	711	0
RNN	RONNE, DENMARK	N	FGN	298	0	242	0	272	0	812	0
RNO	RENO, NV, USA	N	YES	25150	1	20535	1	20236	0	65921	2
ROA	ROANOKE, VA, USA	N	YES	3910	1	4468	0	4283	0	12661	1
ROB	MONROVIA ROBERTS, LIBERIA	N	FGN	320	0	210	0	296	0	826	0
ROC	ROCHESTER, NY, USA	N	YES	13533	0	13078	1	17916	1	44527	2
ROK	ROCKHAMPTON, QLD, AUSTRALIA	S	FGN	3570	0	3750	0	2933	0	10253	0
ROR	KOROR, PALAU ISLAND, PACIFIC OCEAN	N	FGN	132	0	39	0	0	0	171	0
ROS	ROSARIO, ARGENTINA	S	FGN	1704	0	1478	0	900	0	4082	0
ROT	ROTORUA, NEW ZEALAND	S	FGN	0	0	292	0	482	0	774	0
RPR	RAIPUR, INDIA	N	FGN	1460	0	830	0	738	0	3028	0
RRS	ROROS, NORWAY	N	FGN	782	0	792	0	790	0	2364	0
RSW	FORT MYERS REGIONAL, FL, USA	N	YES	2486	0	7120	0	6729	0	16335	0
RTB	ROATAN, HONDURAS	N	FGN	0	0	188	0	1482	0	1670	0
RUH	RIYADH, SAUDI ARABIA	N	FGN	21799	0	21703	1	22246	0	65748	1
RUN	REUNION ISLAND, INDIAN OCEAN	S	FGN	436	0	410	0	304	0	1150	0
SAB	SABA, NETH. ANTILLES	N	FGN	0	0	0	1	0	0	0	1
SAH	SANAA, YEMEN	N	FGN	1580	0	1379	0	1291	0	4250	0
SAL	SAN SALVADOR, EL SALVADOR	N	FGN	6574	0	7271	0	8073	1	21918	1
SAN	SAN DIEGO, CA, USA	N	YES	36109	0	46848	1	55661	0	138618	1
SAO	SAO PAULO, BRAZIL	S	FGN	0	0	0	1	0	0	0	1
SAP	SAN PEDRO, SULA, HONDURAS	N	FGN	3411	0	4099	0	3944	0	11454	0
SAT	SAN ANTONIO, TX, USA	N	YES	31907	2	36421	1	33551	1	101879	4
SAV	SAVANNAH, GA, USA	N	YES	5077	0	4364	0	6639	1	16080	1
SBA	SANTA BARBARA, CA, USA	N	YES	2895	0	3035	0	3666	0	9596	0
SBN	SOUTH BEND, IN, USA	N	YES	1496	0	1708	0	2294	0	5498	0
SCC	PRUDHOE BAY, DEADHORSE, AS, USA	N	NO	3834	1	3908	0	3878	0	11620	1
SCK	STOCKTON, CA, USA	N	YES	787	0	0	0	0	0	787	0
SCL	SANTIAGO, CHILE	S	FGN	3733	0	5184	0	5928	0	14845	0
SCN	SAARBRUECKEN, FRG	N	FGN	0	0	0	1	8	0	8	1
SCQ	SANTIAGO DE COMPOSTELA, SPAIN	N	FGN	0	0	0	0	348	0	348	0
SDA	BAGHDAD-SADDAM, IRAQ	N	FGN	2599	0	1451	0	1406	0	5456	0
SDD	LUBANGO, ANGOLA	S	FGN	862	0	784	0	694	0	2340	0
SDE	SANTIAGO DEL ESTERO, ARGENTINA	S	FGN	910	0	732	0	690	0	2332	0
SDF	LOUISVILLE, KY, USA	N	YES	11936	1	11837	0	9752	0	33525	1
SDJ	SENDAI, JAPAN	N	FGN	2796	0	3276	1	3527	0	9599	1
SDK	SANDAKAN, SABAH, MALAYSIA	N	FGN	2190	0	2196	0	4340	0	8726	0
SDQ	SANTO DOMINGO, DOMINICAN REP	N	FGN	0	0	124	0	208	0	332	0
SEA	SEATTLE/TACOMA, WA, USA	N	YES	27059	0	29147	0	26176	0	82382	0
SEL	SEOUL, REP OF KOREA	N	FGN	0	0	0	0	2376	0	2376	0
SEZ	MAHE IS. SEYCHELLES IS.	S	FGN	0	0	93	0	57	0	150	0
SFA	SFAX, TUNISIA	N	FGN	186	0	194	0	188	0	568	0
SFN	SANTA FE, ARGENTINA	S	FGN	624	0	784	0	686	1	2094	1
SFO	SAN FRANCISCO-OAKLAND, CA, USA	N	YES	82408	2	78067	4	94302	1	254777	7
SFT	SKELLEFTEA, SWEDEN	N	FGN	0	0	0	0	2	0	2	0
SGF	SPRINGFIELD, MO, USA	N	YES	3704	0	2335	0	2381	0	8420	0
SGN	HO CHI MINH, SOC REP OF VIETNAM	N	FGN	0	0	0	0	88	0	88	0

AIRPORT	APTDEF	HEMISP	CONUS	STGFY87	ING1	STGFY88	ING2	STGFY89	ING3	STG737	INGS
SHA	SHANGHAI, P. R. CHINA	N	FGN	1678	0	2060	0	2291	0	6029	0
SHE	SHENYANG, P. R. CHINA	N	FGN	208	0	400	0	444	0	1052	0
SHI	SHIMOJISHIMA, JAPAN	N	FGN	0	0	0	1	0	0	0	1
SHJ	SHARJAH, U. A. EMIRATES	N	FGN	2588	0	2845	0	2934	0	8367	0
SHV	SHREVEPORT, LA, USA	N	YES	3098	0	3472	0	2510	0	9080	0
SHW	SHARURAH, SAUDI ARABIA	N	FGN	730	0	730	0	732	0	2192	0
SIA	XI AN, P. R. CHINA	N	FGN	848	0	991	0	1265	0	3104	0
SID	SAL, CAPE VERDE ISLAND	N	FGN	10	0	40	0	0	0	50	0
SIN	SINGAPORE, SINGAPORE	N	FGN	6631	0	6354	0	6479	0	19464	0
SIT	SITKA, AS, USA	N	NO	778	0	782	0	778	0	2338	0
SJC	SAN JOSE, CA, USA	N	YES	37310	2	37278	0	37768	2	112356	4
SJD	LOS CABOS, MEXICO	N	FGN	0	0	38	0	0	0	38	0
SJJ	SARAJEVO, YUGOSLAVIA	N	FGN	174	0	356	0	564	0	1094	0
SJO	SAN JOSE, COST RICA	N	FGN	3317	0	3409	0	3128	0	9854	0
SJU	SAN JUAN, PUERTO RICO	N	FGN	0	0	60	0	0	0	60	0
SKG	THESSALONIKI, GREECE	N	FGN	1987	0	1721	0	1473	0	6181	0
SKO	SOKOTO, NIGERIA	N	FGN	1182	0	732	0	598	0	2512	0
SKP	SKOPJE, YUGOSLAVIA	N	FGN	210	0	710	0	722	0	1642	0
SKS	SKRYDSTRUP, DENMARK	N	FGN	45	0	0	0	0	0	45	0
SKZ	SUKKUR, PAKISTAN	N	FGN	566	0	720	0	870	0	2156	0
SLA	SALTA, ARGENTINA	S	FGN	1934	0	1947	1	1622	0	5503	1
SLC	SALT LAKE CITY, UT, USA	N	YES	77961	1	72870	0	70403	2	221234	3
SLL	SALALAH, OMAN	N	FGN	882	0	964	0	1010	1	2856	1
SLZ	SAO LUIZ, MARANHAO, BRAZIL	S	FGN	3629	0	4701	1	7507	0	15837	1
SMF	SACRAMENTO, CA, USA	N	YES	18876	0	24452	1	19931	1	63259	2
SMI	SAMOS ISLAND, GREECE	N	FGN	1678	0	1608	0	1774	0	5060	0
SNA	ORANGE COUNTY, CA, USA	N	YES	24680	1	22489	0	23389	0	70558	1
SNN	SHANNON, IRELAND	N	FGN	1999	0	2715	0	3658	0	8372	0
SNO	SAKON NAKHON, THAILAND	N	FGN	566	0	282	0	0	0	848	0
SOF	SOFIA, BULGARIA	N	FGN	671	0	547	0	462	0	1680	0
SPC	SANTA CRUZ LA PALMA, CANARY IS.	N	FGN	0	0	1272	0	1186	0	2458	0
SPP	MENONGUE, ANGOLA	S	FGN	224	0	208	0	346	0	778	0
SPU	SPLIT, YUGOSLAVIA	N	FGN	1592	0	2213	0	1915	0	5720	0
SRQ	SARASOTA/BRADENTON, FL, USA	N	YES	657	0	994	1	2481	1	4132	2
SSA	SALVADOR, BRAZIL	S	FGN	9230	0	11330	0	16768	0	37328	0
SSG	MALABO, EQUATORIAL GUINEA	N	FGN	126	0	206	0	96	0	428	0
STL	ST LOUIS, MO, USA	N	YES	20660	0	25797	0	30162	0	76619	0
STM	SANTAREM, BRAZIL	S	FGN	3318	0	3913	0	4380	0	11611	0
STN	LONDON-STANSTED, ENGLAND, UK	N	FGN	0	0	874	0	1745	1	2619	1
STR	STUTTGART, FRG	N	FGN	18747	1	19270	4	21956	2	59973	7
STT	ST THOMAS, VIRGIN ISLANDS	N	FGN	748	0	732	0	730	0	2210	0
STV	SURAT, INDIA	N	FGN	0	1	0	0	0	0	0	1
STX	ST CROIX, VIRGIN ISLANDS	N	FGN	730	0	732	0	730	0	2192	0
SUB	SURABAYA, INDONESIA	S	FGN	0	0	0	0	80	0	80	0
SUV	SUVA, FIJI	S	FGN	650	0	582	0	565	0	1797	0
SUX	SIOUX CITY, IO, USA	N	YES	1536	0	2844	0	2127	0	6507	0
SVB	SAMBAVA, MADAGASCAR	S	FGN	274	0	220	0	294	0	788	0
SVG	STAVANGER, NORWAY	N	FGN	16946	0	18466	0	19633	1	55045	1
SVO	MOSCOW-SHEREMETYE, U.S.S.R.	N	FGN	864	0	962	0	1320	0	3146	0
SVP	KUITO, ANGOLA	S	FGN	422	0	392	0	316	0	1130	0
SVQ	SEVILLE, SPAIN	N	FGN	0	0	804	0	2074	0	2878	0
SWA	SHANTON, P. R. CHINA	N	FGN	0	0	507	0	1166	0	1673	0
SXB	STRASBOURG, FRANCE	N	FGN	76	0	4	0	86	0	166	0
SXF	BERLIN, GDR	N	FGN	86	0	202	0	470	0	758	0
SKR	SRINAGAR, INDIA	N	FGN	2123	1	2035	1	2692	0	6850	2
SYA	SHEMYA IS., AS, USA	N	NO	0	0	16	0	0	0	16	0
SYD	SYDNEY, N.S.W., AUSTRALIA	S	FGN	16325	2	21343	0	33543	2	71211	4
SYR	SYRACUSE, NY, USA	N	YES	10961	0	18007	1	25961	0	54929	1
SYZ	SHIRAZ, IRAN	N	FGN	3868	0	3768	0	3554	0	11190	0
SZG	SALZBURG, AUSTRIA	N	FGN	648	0	653	0	650	0	1951	0
TAI	TAIZ, YEMEN	N	FGN	820	0	872	0	690	0	2382	0
TAO	QINGDAO, P.R. CHINA	N	FGN	0	0	0	0	157	0	157	0
TBO	TABORA, TANZANIA	S	FGN	36	0	0	0	0	0	36	0
TBP	TUMBES, PERU	S	FGN	404	0	576	0	338	0	1318	0
TBT	TABATINGA, BRAZIL	S	FGN	764	0	852	0	836	0	2452	0
TBU	TONGATAPU, TONGA ISLAND, PACIFIC	S	FGN	667	0	323	0	316	0	1306	0
TBZ	TABRIZ, IRAN	N	FGN	214	0	0	0	0	0	214	0
TCI	TENERIFE, CANARY IS.	N	FGN	0	0	0	0	0	1	0	1
TEE	TBESSA, ALGERIA	N	FGN	652	0	628	0	624	0	1904	0
TER	TERCEIRA, PORTUGAL (AZORES)	N	FGN	87	0	260	0	253	0	600	0
TET	TETE, MOZAMBIQUE	S	FGN	364	0	364	0	158	0	886	0
TEZ	TEZPUR, INDIA	N	FGN	728	0	732	0	730	0	2190	0
TFF	TEFE, BRAZIL	S	FGN	246	0	208	0	264	0	718	0
TFN	TENERIFE, SPAIN	N	FGN	0	0	1842	0	1640	0	3482	0
TFS	TENERIFFE-REINASOFIA, CANARY ISLAND	N	FGN	244	1	874	1	1499	1	2617	3

AIRPORT	APTDEF	HEMISPHR	CONUS	STGFY87	ING1	STGFY88	ING2	STGFY89	ING3	STG737	INGS
TGD	TITOGRAO, YUGOSLAVIA	N	FGN	616	1	754	0	1002	0	2372	1
TGG	KUALA, TERENGGANU, MALAYSIA	N	FGN	438	0	418	0	640	0	1496	0
TGT	TANGA, TANZANIA	S	FGN	26	0	0	0	0	0	26	0
TGU	TEGUCIGALPA, HONDURAS	N	FGN	3746	0	4286	0	4645	0	12677	0
THE	TERESINA, PIAUI, BRAZIL	S	FGN	2920	0	3972	0	5418	0	12310	0
THR	TEHRAN, IRAN	N	FGN	4370	0	3536	0	4434	0	12340	0
TIA	TIRANA, ALBANIA	N	FGN	104	0	104	0	208	0	416	0
TIF	TAIF, SAUDI ARABIA	N	FGN	1484	0	926	0	888	C	3298	0
TIN	TINDOUF, ALGERIA	N	FGN	1006	0	962	0	966	0	2934	0
TIP	TRIPOLI, LIBYA	N	FGN	287	0	626	0	453	0	1366	0
TIV	TIVAT, YUGOSLAVIA	N	FGN	188	0	364	0	227	0	779	0
TKO	KIGOMA, TANZANIA	S	FGN	18	0	0	0	0	C	18	0
TLE	TULEAR, MADAGASCAR	S	FGN	490	0	528	0	348	0	1366	0
TLH	TALLAHASSEE, FL, USA	N	YES	0	0	1376	0	1711	0	3087	0
TLM	TILIMSEN, ALGERIA	N	FGN	1046	0	831	0	517	0	2394	0
TLS	TOULOUSE, FRANCE	N	FGN	1152	0	1107	0	1306	0	3565	0
TLV	TEL AVIV-YAFO, ISRAEL	N	FGN	2334	1	1608	0	2173	0	6115	1
TMM	TAMATAVE, MADAGASCAR	S	FGN	150	0	14	0	60	0	224	0
TMR	TAMANRASSET, ALGERIA	N	FGN	1228	0	1058	0	1136	0	3422	0
TMS	SAO TOME ISLAND, SAO TOME ISLAND	N	FGN	124	0	144	0	104	0	372	0
TNG	TANGIER, MOROCCO	N	FGN	2117	3	2241	0	2281	1	6639	4
TNN	TAINAN, TAIWAN	N	FGN	3324	0	3452	0	3444	0	10220	0
TNR	ANTANANARIVO, MADAGASCAR	S	FGN	1953	0	1801	0	1659	0	5413	0
TOE	TOZEUR, TUNISIA	N	FGN	86	0	18	0	4	0	108	0
TOL	TOLEDO, OH, USA	N	YES	1724	0	1192	0	545	0	3461	0
TOS	TROMSO, NORWAY	N	FGN	2080	0	2518	0	2557	0	7155	0
TOY	TOYAMA, JAPAN	N	FGN	1522	0	446	0	48	0	2016	0
TPA	TAMPA/ST PETERSBURG, FL, USA	N	YES	19425	0	19630	0	24615	1	63670	1
TPE	TAIPEI, TAIWAN	N	FGN	0	0	34	0	366	0	400	0
TPP	TARAPOTO, PERU	S	FGN	656	0	486	0	964	0	2106	0
TRD	TRONDHEIM, NORWAY	N	FGN	11039	0	13061	0	14345	0	38445	0
TRI	TRI-CITY AIRPORT, TN, USA	N	YES	2166	0	2926	0	2413	0	7505	0
TRN	TURIN, ITALY	N	FGN	932	0	1798	1	2048	0	4778	1
TRU	TRUJILLO, PERU	S	FGN	28	0	28	0	450	0	506	0
TRV	TRIVANDRUM, INDIA	N	FGN	2374	3	2708	1	2714	0	7796	4
TRW	TARAWA, REP OF KIRIBATI	N	FGN	106	0	104	0	52	0	262	0
TRZ	TIRUCHIRAPALLY, INDIA	N	FGN	2318	0	2094	0	2052	0	6464	0
TSA	TAIPEI-SUNG SHAN, TAIWAN	N	FGN	22439	0	26214	0	28454	0	77107	0
TSF	TREVISO, ITALY	N	FGN	0	0	0	0	110	0	110	0
TSN	TIANJIN, P. R. CHINA	N	FGN	954	0	1421	0	1550	0	3925	0
TSV	TOWNSVILLE, QLD, AUSTRALIA	S	FGN	6252	1	6051	0	7323	1	19626	2
TTJ	TOTTORI, JAPAN	N	FGN	1460	0	1464	1	1460	1	4384	2
TTT	TAITUNG, TAIWAN	N	FGN	1488	0	1802	0	1880	0	5170	0
TUC	TUCUMAN, ARGENTINA	S	FGN	2409	0	2433	2	2264	1	7106	3
TUI	TURAIF, SAUDI ARABIA	N	FGN	0	0	0	0	38	0	38	0
TUL	TULSA, OK, USA	N	YES	30215	0	29642	3	25417	0	85274	3
TUN	TUNIS, TUNISIA	N	FGN	5129	1	3906	1	4307	0	13342	2
TUR	TUCURUI, BRAZIL	S	FGN	419	0	417	0	187	0	1023	0
TUS	TUCSON, AZ, USA	N	YES	14844	0	14048	0	19849	0	48741	0
TUU	TABUK, SAUDI ARABIA	N	FGN	4152	0	3910	0	3222	0	11284	0
TVL	LAKE TAHOE, CA, USA	N	YES	2274	1	1985	0	1982	0	6241	1
TWU	TAWAU, SABAH, MALAYSIA	N	FGN	2920	0	2928	0	4256	0	10104	0
TXL	WEST BERLIN, GERMANY	N	FGN	17484	1	18958	0	28902	0	65344	1
TYL	TALARA, PERU	S	FGN	12	0	700	0	338	0	1050	0
TYN	TAIYUAN, P. R. CHINA	N	FGN	104	0	122	0	182	0	408	0
TYS	KNOXVILLE, TN, USA	N	YES	4917	0	5269	0	5066	0	15252	0
UAQ	SAN JUAN, ARGENTINA	S	FGN	546	0	706	0	614	0	1866	0
UBA	UBERABA, BRAZIL	S	FGN	1186	0	1464	0	1460	0	4110	0
UBJ	UBE, JAPAN	N	FGN	2496	0	1411	0	1247	0	5154	0
UBP	UBON PATCHATHANI, THAILAND	N	FGN	730	0	732	0	394	0	1856	0
UDI	UBERLANDIA, BRAZIL	S	FGN	1186	0	1464	0	1460	0	4110	0
UDR	UDAIPUR, INDIA	N	FGN	1460	0	2126	0	1866	i	5452	1
UEL	QUELIMANE, MOZAMBIQUE	S	FGN	418	0	420	0	208	0	1046	0
UET	QUETTA, PAKISTAN	N	FGN	832	1	1566	0	1652	0	4050	1
UIO	QUITO, ECUADOR	S	FGN	1609	0	0	0	0	0	1609	0
UNK	UNALAKLEET, AS, USA	N	NO	4	0	270	0	658	0	932	0
URT	SURAT THANI, THAILAND	N	FGN	798	0	1272	0	1202	0	3272	0
URY	GURAYAT, SAUDI ARABIA	N	FGN	740	0	942	0	866	0	2548	0
USH	USHUAIA, ARGENTINA	S	FGN	1804	0	1544	0	1532	0	4880	0
UTH	UDON, THANI, THAILAND	N	FGN	738	0	732	0	314	0	1784	0
UTN	UPINGTON, SOUTH AFRICA	S	FGN	882	0	856	0	832	1	2570	1
UTP	UTAPAO, THAILAND	N	FGN	0	0	184	0	356	0	540	0
UVL	NEW VALLEY, ARAB REP OF EGYPT	N	FGN	315	0	312	0	312	0	939	0
VBY	VISBY, SWEDEN	N	FGN	0	0	0	0	2	0	2	0
VCE	VALVERDE, CANARY ISLANDS	N	FGN	1729	0	1335	0	1588	1	4652	1

AIRPORT	APTDEF	HEMISPHR	CONUS	STGFY87	ING1	STGFY88	ING2	STGFY89	ING3	STG737	INGS
VCP	SAO PAULO - VIRACOPOS, BRAZIL	S	FGN	104	0	56	0	0	0	160	0
VDM	VIDEHA, ARGENTINA	S	FGN	416	1	460	0	540	0	1416	1
VFA	VICTORIA FALL, ZIMBABWE	S	FGN	610	0	1292	0	1232	0	3134	0
VHC	SAURIMO, ANGOLA	S	FGN	252	0	234	0	384	0	870	0
VIE	VIENNA, AUSTRIA	N	FGN	5820	0	6195	0	7904	2	19919	2
VIL	DAKHLA, MOROCCO	N	FGN	8	0	58	0	78	0	144	0
VIX	VITORIA, ESPIRITO SANTO, BRAZIL	S	FGN	2878	0	3794	0	4160	0	10832	0
VLC	VALENCIA, SPAIN	N	FGN	206	0	342	0	1296	0	1844	0
VLG	VILLA GESELL, ARGENTINA	S	FGN	154	0	148	0	104	0	406	0
VLJ	PORT VILA, VANUATU	S	FGN	251	0	560	0	934	0	1745	0
VNC	VENICE, ITALY	N	FGN	0	0	0	0	0	1	0	1
VNS	VARANASI, INDIA	N	FGN	3150	4	2686	3	2466	1	8302	8
VRN	VERONA, ITALY	N	FGN	0	0	3	0	8	0	11	0
VTE	VIENTIANE, LAOS	N	FGN	0	0	52	0	142	0	194	0
VTZ	VISHAKHAPATNAM, INDIA	N	FGN	1722	0	1774	0	1902	0	5398	0
VVI	SANTA CRUZ, VIRU VIRU, BOLIVIA	S	FGN	104	0	208	0	466	0	778	0
VXC	LICHINGA, MOZAMBIQUE	S	FGN	312	0	318	0	110	0	740	0
WAW	WARSAW, POLAND	N	FGN	1027	0	755	0	1162	0	2944	0
WDH	WINDHOEK, NAMIBIA	S	FGN	1862	1	1988	0	1942	1	5792	2
WKJ	WAKKANAI, JAPAN	N	FGN	0	0	550	0	562	0	1112	0
WLG	WELLINGTON, NEW ZEALAND	S	FGN	17828	2	28370	1	29044	1	75242	4
WLS	WALLIS IS, WALLIS & FUTUNA IS	S	FGN	0	0	0	0	180	0	180	0
WRG	WRANGELL, AS, USA	N	NO	1460	0	1464	0	1460	0	4384	0
WUH	WUHAN, P. R. CHINA	N	FGN	2002	0	2073	0	1307	0	5382	0
XMN	XIAMEN, P. R. CHINA	N	FGN	2254	0	3433	1	4474	1	10161	2
XRY	JEREZ DE LA FRONTERA, SPAIN	N	FGN	0	1	0	0	0	0	0	1
YAK	YAKUTAT, AS, USA	N	NO	1460	0	1464	0	1460	0	4384	0
YAM	SAULT STE MARIE, ONT., CANADA	N	FGN	3540	1	3286	1	1338	0	8164	2
YAO	YAOUNDE, REP OF CAMEROON	N	FGN	4147	0	3353	0	3493	0	10993	0
YBC	BAIE COMEAU, QUEBEC, CANADA	N	FGN	276	0	106	0	252	0	634	0
YBG	SAGUENAY, QUE, CANADA	N	FGN	520	0	264	0	244	0	1028	0
YBR	BRANDON, MAN, CANADA	N	FGN	1252	0	948	0	224	0	2424	0
YCB	CAMBRIDGE BAY, NWT, CANADA	N	FGN	239	0	296	0	338	0	873	0
YCG	CASTLEGAR, BC, CANADA	N	FGN	626	0	364	0	0	0	990	0
YCH	CHATHAM, NB, CANADA	N	FGN	626	0	550	0	56	0	1232	0
YCL	CHARLO, NB, CANADA	N	FGN	626	0	550	0	56	0	1232	0
YDF	DEER LAKE, Nfld, CANADA	N	FGN	2855	0	2432	0	2131	0	7418	0
YDQ	DAWSON CREEK, BC, CANADA	N	FGN	626	0	310	0	0	0	936	0
YEG	EDMONTON, ALTA, CANADA	N	FGN	11693	0	10938	0	10359	0	32990	0
YEV	INUVIK, NWT, CANADA	N	FGN	745	0	912	0	1232	0	2889	0
YFB	IQALUIT, NWT, CANADA	N	FGN	1769	0	1576	0	1714	0	5059	0
YFC	FREDERICTON, NB, CANADA	N	FGN	1342	0	1054	0	1120	0	3516	0
YFO	FLIN FLOW, MAN, CANADA	N	FGN	420	0	374	0	406	0	1200	0
YFS	FT SIMPSON, NWT, CANADA	N	FGN	0	0	0	0	42	0	42	0
YGJ	YONAGO, JAPAN	N	FGN	2190	0	2008	0	2180	0	6378	0
YGL	LA GRANDE, QUE, CANADA	N	FGN	1044	0	1092	0	1050	0	3186	0
YGW	KUUJJUARAPIK, QUE, CANADA	N	FGN	522	0	524	0	520	0	1566	0
YGX	GILLAM, MAN, CANADA	N	FGN	832	0	848	0	844	0	2524	0
YHD	DRYDEN, ONT, CANADA	N	FGN	2699	0	1520	0	0	0	4219	0
YHY	HAY RIVER, NWT, CANADA	N	FGN	1252	0	1256	1	1252	1	3760	2
YHZ	HALIFAX, NS, CANADA	N	FGN	14221	0	14832	0	14257	2	43310	2
YJT	STEPHENVILLE, Nfld, CANADA	N	FGN	144	0	0	0	0	0	144	0
YKA	KAMLOOPS, BC, CANADA	N	FGN	2650	0	2804	1	1498	0	6952	1
YLB	KELOWNA, BC, CANADA	N	FGN	8790	0	7473	2	5321	0	21534	2
YMM	FT MCMURRAY, ALTA, CANADA	N	FGN	1148	0	1152	1	1144	0	3444	1
YMS	YURIMAGUAS, PERU	S	FGN	210	0	264	0	96	0	570	0
YMX	MONTREAL MIRABEL, QUE, CANADA	N	FGN	569	0	138	0	1	0	708	0
YNB	YANBU, SAUDI ARABIA	N	FGN	2513	0	2511	0	2533	0	7557	0
YNG	YOUNGSTOWN, OH, USA	N	YES	330	0	0	0	0	0	330	0
YOL	YOLA, NIGERIA	N	FGN	1279	0	1261	0	792	0	3332	0
YOW	OTTAWA, ONT, CANADA	N	FGN	10695	0	15822	0	15489	1	42006	1
YPR	PRINCE RUPERT, BC, CANADA	N	FGN	1436	0	1412	0	1548	0	4396	0
YQB	QUEBEC, QUE, CANADA	N	FGN	1356	0	1003	1	1309	1	3668	2
YQD	THE PAS, MAN, CANADA	N	FGN	630	0	628	0	624	0	1882	0
YQG	WINDSOR, ONT, CANADA	N	FGN	2351	0	1093	0	14	0	3458	0
YQH	WATSON LAKE, YT, CANADA	N	FGN	335	0	184	0	0	0	519	0
YQM	MONCTON, NB, CANADA	N	FGN	0	0	557	0	525	0	1082	0
YQR	REGINA, SASK, CANADA	N	FGN	3925	0	4110	1	5168	0	13203	1
YQT	THUNDER BAY, ONT, CANADA	N	FGN	6659	0	5058	1	3257	0	14974	1
YQU	GRANDE PRAIRIE, ALBA, CANADA	N	FGN	1568	0	912	0	0	0	2480	0
YQX	GANDER, Nfld, CANADA	N	FGN	748	0	675	0	62	0	1485	0
YQY	SYDNEY, NS, CANADA	N	FGN	1846	0	1464	0	1342	0	4652	0
YQZ	QUESNEL, BC, CANADA	N	FGN	442	0	304	0	0	0	746	0
YRB	RESOLUTE, NT, CANADA	N	FGN	417	0	418	0	416	0	1251	0
YRT	RANKIN INLET, NWT, CANADA	N	FGN	0	0	0	0	328	0	328	0

AIRPORT	APTDEF	HEMISP	HR	CONUS	STGFY87	ING1	STGFY88	ING2	STGFY89	ING3	STG737	INGS
YSB	SUBDURY, ONT, CANADA	N	FGN		1092	0	0	0	0	0	1092	0
YSJ	SAINT JOHN, NB, CANADA	N	FGN		1358	0	1464	0	1319	0	4141	0
YSM	FT SMITH, NWT, CANADA	N	FGN		1252	0	1256	0	1252	0	3760	0
YSR	NANISIVIK NWT, CANADA	N	FGN		208	0	210	0	246	0	664	0
YTH	THOMPSON, MAN, CANADA	N	FGN		1006	0	1008	0	1016	0	3030	0
YUL	MONTREAL, QUEBEC, CANADA	N	FGN		19081	1	23752	2	22533	4	65366	7
YUM	YUMA, AZ, USA	N	YES		31	0	408	0	0	0	439	0
YUX	HALL BEACH, NWT, CANADA	N	FGN		210	0	210	0	208	0	628	0
YUY	ROUYN-NORANDA, QUEBEC, CANADA	N	FGN		0	0	0	0	48	0	48	0
YVO	VAL D'OR, QUE, CANADA	N	FGN		1887	0	1204	0	1299	1	4390	1
YVP	FT CHIMO, QUE, CANADA	N	FGN		1178	0	1036	0	1408	0	3622	0
YVQ	NORMAN WELLS, NWT, CANADA	N	FGN		1133	0	1618	0	1588	1	4339	1
YVR	VANCOUVER, BC, CANADA	N	FGN		38426	0	38128	3	33322	3	109876	6
YWG	WINNIPEG, MAN, CANADA	N	FGN		13898	0	16176	2	14677	1	44751	3
YWK	WABUSH, NFLD, CANADA	N	FGN		964	0	976	0	1050	0	2990	0
YWL	WILLIAMS LAKE, BC, CANADA	N	FGN		442	0	304	0	0	0	746	0
YXC	CRANBROOK, BC, CANADA	N	FGN		2712	0	2800	0	1714	0	7226	0
YXD	EDMONTON-MUNICIPAL, ALBERTA, CANADA	N	FGN		10271	1	11878	0	11943	1	34092	2
YXE	SASKATOON, SASK, CANADA	N	FGN		3934	0	4688	0	5216	0	13838	0
YXJ	FT ST JOHN, BC, CANADA	N	FGN		3958	1	3491	1	2242	0	9691	2
YXS	PRINCE GEORGE, BC, CANADA	N	FGN		5052	1	4592	0	3975	1	13619	2
YXT	TERRACE, BC, CANADA	N	FGN		1790	0	1412	0	1594	0	4796	0
YXU	LONDON, ONT, CANADA	N	FGN		422	0	992	0	341	0	1755	0
YXY	WHITEHORSE, YT, CANADA	N	FGN		1479	0	1382	0	1552	0	4413	0
YYC	CALGARY, ALBERTA, CANADA	N	FGN		33327	1	33794	0	29159	4	96280	5
YYD	SMITHERS, BC, CANADA	N	FGN		904	0	1274	0	1306	0	3484	0
YYE	FT NELSON, BC, CANADA	N	FGN		962	0	548	0	0	0	1510	0
YYF	PENTICTON, BC, CANADA	N	FGN		2964	0	1643	0	0	0	4607	0
YYG	CHARLOTTETOWN, PEI, CANADA	N	FGN		1699	0	1403	0	852	0	3954	0
YYJ	VICTORIA, BC, CANADA	N	FGN		871	0	1265	1	690	1	2826	2
YYL	LYNN LAKE, MAN, CANADA	N	FGN		32	0	32	0	0	0	64	0
YYQ	CHURCHILL, MAN, CANADA	N	FGN		412	0	424	0	422	0	1258	0
YYR	GOOSE BAY, NFLD, CANADA	N	FGN		1733	0	1721	0	1898	0	5352	0
YYT	ST JOHNS, NFLD, CANADA	N	FGN		4331	0	4782	1	4680	0	13793	1
YYY	MONT JOLI, QUE, CANADA	N	FGN		276	0	106	0	242	0	624	0
YYZ	TORONTO, ONTARIO, CANADA	N	FGN		44100	1	49334	1	43077	1	136511	3
YZF	YELLOWKNIFE, NWT, CANADA	N	FGN		3253	0	3578	0	5142	1	11973	1
YZP	SANDSPIT, BC, CANADA	N	FGN		774	0	1282	0	1260	1	3316	1
YZT	PORT HARDY, BC, CANADA	N	FGN		708	0	0	0	0	0	708	0
YZV	SETP-ILES, QUE, CANADA	N	FGN		603	0	612	0	640	0	1855	0
ZAD	ZADAR, YUGOSLAVIA	N	FGN		52	0	109	0	164	0	325	0
ZAG	ZAGREB, YUGOSLAVIA	N	FGN		6743	0	8422	0	9322	0	24487	0
ZAH	ZAHEBAN, IRAN	N	FGN		88	0	210	0	160	0	458	0
ZCO	TEMUCO, CHILE	S	FGN		0	0	558	0	834	0	1392	0
ZHA	ZHANGJIANG, P. R. CHINA	N	FGN		416	0	579	0	723	0	1718	0
ZIH	IXTAPA/ZIHUATANEJO, MEXICO	N	FGN		44	0	146	0	482	0	672	0
ZNZ	ZANZIBAR, TANZANIA	S	FGN		1098	0	412	0	210	0	1720	0
ZRH	ZURICH, SWITZERLAND	N	FGN		12226	3	13751	0	15344	0	41321	3
ZTH	ZAKINTHOS, GREECE	N	FGN		676	1	718	0	748	1	2142	2
ZUM	CHURCHILL FALLS, NFLD, CANADA	N	FGN		216	0	210	0	192	0	618	0

APPENDIX B

CONTENTS OF FAA BIRD INGESTION DATA BASE BOEING 737 AIRCRAFT OCTOBER 1986 - SEPTEMBER 1989

This appendix presents the contents of the Boeing 737 bird ingestion data base maintained by the FAA. The appendix presents actual data extracted from the FAA data base which contains bird ingestion data supplied by the engine manufacturers, FAA, and ICAO. The data base contents are described below:

<u>COLUMN</u>	<u>DESCRIPTION OF COLUMN CONTENTS</u>
EDATE	Date (mm/dd/yyyy) of ingestion event.
EVT#	FAA bird ingestion event sequence number reflecting order in which events were entered into the FAA bird ingestion data base.
ENG_POS	Engine position of engine ingesting bird. Since each engine ingestion event has a unique record in the data base, duplicate event numbers indicate multiple engine ingestion events. This column provides record uniqueness in such cases. 1 - left engine of 737 airplane 2 - right engine of 737 airplane
MFG_NO.	Manufacturer's event number. The prefix values 87, 88, and 89 imply ICAO events reported in years 1987, 1988, and 1989 respectively. The value 0 implies events reported from FAA sources.
ETIME	Local time of bird ingestion.
SIGN_EVT	Significant event factors. AIRWRTHY - engine related airworthiness effects INV POS LOSS - involuntary power loss MULT P' DS - multiple birds in one engine MULT EN - multiple engine ingestion (1 bird in each engine) MULT ENG IRDS - multiple engine ingestion and one or both engines sustained multiple bird ingestion TRVS FRAC - transverse fan blade fracture OTHER - other significant factor, may be reported in REMARKS NONE - no significant factor noted
AIRCRAFT	737 aircraft type.
POF	Phase of flight during which bird ingestion occurred. (TAXI;TAKEOFF;CLIMB;CRUISE;APPROACH;LANDING;UNKNOWN)
ALTITUDE	Altitude (ft. AGL) at time of bird ingestion.
SPEED	Air speed (kn) at time of bird ingestion.
FL_RULES	Flight rules in effect at time of bird ingestion. IFR - instrument flight rules VFR - visual flight rules UNK - unknown

LT_CONDS Light conditions at time of bird ingestion.
 (DARK;LIGHT;DAWN;DUSK;etc.)

WEATHER Weather conditions at time of bird ingestion.

CREW_AC Crew action taken in response to bird ingestion.
 ATO - aborted takeoff
 ATB - air turnback
 DIV - diversion
 UNK - unknown
 NONE - no crew action taken
 N/A - not applicable
 OTHER - some action taken, may be specified in narrative remarks

CREW_AL Indicates whether crew alerted to presence of birds at time of
 bird ingestion.
 (YES;NO;UNKNOWN)

BIRD_SEE Indicates whether ingested bird(s) seen prior to ingestion
 NO - not seen
 YES - seen
 SEVERAL - two to ten birds observed
 FLOCK - more than ten birds observed

BIRD_NAM Common bird name. Trailing asterisk (*) implies bird not
 positively identified as such.

BIRD_SPE Species of positively identified bird. Alphanumeric
 identification code which conforms to Edward's[†] convention.

#_BIRDS Number of birds ingested. An asterisk (*) implies more than one
 bird; however, the exact count is unknown.

WT_OZ_1 Weight (oz.) of first ingested bird.

CTY_PRS Scheduled city pairs of aircraft operation.
 (from code:to code) 3-letter city airport code. Reference
 AIRPORT column in Appendix A.

AIRPORT Airport at which bird ingestion event occurred.
 3- or 4-letter airport code. See AIRPORT column in Appendix A.

LOCALE Nearest town, state, country, etc.

US_INCID Indicates whether bird ingestion occurred within US boundaries.
 (YES;NO)

ENGINE Engine model.
 (CFM56;JT8D)

DASH Engine dash number.

[†] Edwards, E.P., "A Coded List of Birds of the Worlds,"
 IBSN:911882-04-9, 1974

DMG_CODE Letter codes summarizing engine damage resulting from the bird ingestion. This column does not exist in the actual FAA data base, but was developed by the contractor to compress 17 YES/NO damage fields into a single column. A letter code appears for damage columns whose values are YES. In the explanation of damage codes below, a number in parentheses indicates the damage severity code which is further explained in the SEVERITY column. The data base column name is given in the explanation of the damage code.

- A(4) - ENG DAM; engine damaged due to bird ingestion
- B(3) - LEAD EDG; leading edge distortion/curl, minor fan blades
- C(3) - BEN/DEN; one to three fan blades bent or dented
- D(2) - BE/DE>3; more than three fan blades bent or dented
- E(3) - TORN<10; one to ten fan blades torn
- F(2) - TORN>10; more than ten fan blades torn
- G(2) - BROKEN; broken fan blade(s), leading edge and/or tip pieces missing; other blades also dented
- H(3) - SHINGLED; shingled (twisted) fan blades
- I(1) - TRVSFRAC; transverse fracture - a fan blade broken chordwise (across) and the piece liberated (includes secondary hard object damage)
- J(2) - SPINNER; dented, broken, or cracked spinner (includes spinner cap)
- K(1) - CORE; bent/broken compressor blades/vanes, blade/vane clash, blocked/disrupted airflow in low, intermediate, and high pressure compressors
- L(3) - NACELLE; dents and/or punctures to the engine enclosure (includes cowl)
- M(1) - FLANGE; flange separations
- N(2) - RELEASED; released (walked) fan blades (blade retention mechanism broken)
- O(1) - TURBINE; turbine damage
- P - OTHER; any damage not previously listed
- Q - UNKNOWN;

SEVERITY Numeric code indicating the severity of engine damage resulting from the bird ingestion. This column was developed by the contractor after analyzing reported damage in the data base. The lower the severity code, the more severe the damage. The severity rating of a flight is determined as the lowest severity rating attained by any of the damage categories. Corresponding severity ratings for each damage category were presented in the DMG_CODE discussion above.

- 1 - most severe damage (damage is known)
- 2 - moderately severe damage (damage is known)
- 3 - least severe damage (damage is known)
- 4 - damage indicated, but not specified
- 9 - no damage reported

POW_LOSS Degree of power loss as a result of bird ingestion

- NONE - no power loss
- EPR DEC - engine pressure ratio decrease
- SPOOL DOWN - engine spooled down
- N1 CHANGE - N1 rotor change
- N2 CHANGE - N2 rotor change

COMPRESSOR - compressor surge/stall
UNKNOWN - unknown whether power loss occurred

MAX_VIBE Maximum vibration reported as a dimensionless unit.

THROTTLE Voluntary throttle change by crew in response to bird ingestion.
ADVANCE - voluntary throttle advance
RETARD - voluntary throttle retard
IDLE - voluntary throttle retard to idle
CUTOFF voluntary throttle retard to cutoff
NONE - no voluntary throttle change

IFSD Indicates whether in-flight shutdown occurred in response to bird ingestion.
NO - no shutdown
VIBES - shutdown due to vibrations
STAL/SURG - shutdown due to compressor stall/surge
HI EGT - shutdown due to high exhaust gas temperature
EPR - shutdown due to incorrect engine pressure ratio
INVLNTRY - involuntary engine shutdown
PARAMTRS - shutdown due to incorrect engine parameters
OTHER - other reasons, may be listed in remarks
UNKNOWN - unknown cause for shutdown

REMARKS Narrative description providing additional information concerning some aspect of the ingestion.

DATA SOURCES: ENGINE MANUFACTURER OR ICAO

EDATE	EVT#	ENG POS	MFG NO	ETIME	SIGN EVT	AIRCRAFT	POF	ALTITUDE	SPEED	FL RULES	LT CONDS	WEATHER	CREW AC	CREW AL	BIRD	SEE
10/01/86	1	1	1	16:20:00	NONE	300	UNKNOWN	700	0	IFR		OVERCAST	NONE			
10/02/86	2	2	3		NONE	300	CLIMB						DIV			
10/02/86	3	3	50		NONE	300	TAXI									
10/04/86	235	4	5		NONE	200	UNKNOWN									
10/05/86	4	1	4		NONE	300	TAXI	100	160	VFR	LIGHT	CLEAR	ATB	NO	YES	
10/08/86	5	2	5		NONE	300	TAXI									
10/10/86	233	4	1037		NONE	200	UNKNOWN									
10/10/86	234	6	6	8:00:00	ENG	300	TAKEOFF		146	VFR	DAWN	SCATTERED	ATB		FLOCK	
10/13/86	6	2	7	8:00:00	MULT ENG	300	TAKEOFF		146	VFR	DAWN	SCATTERED	ATB		FLOCK	
10/13/86	7	2	7		NONE	300	TAKEOFF	0	125	VFR		CLEAR	ATB		FLOCK	
10/16/86	232	7	8		MULT ENG-BIRDS	300	LANDING									
10/16/86	7	2	55		MULT ENG-BIRDS	300	APPROACH									
10/19/86	230	1	55		NONE	200	LANDING	0	90			CLEAR	NONE		FLOCK	
10/19/86	231	1	27		NONE	200	TAKEOFF									
10/20/86	228	1	50		NONE	200	TAKEOFF									
10/20/86	229	2	53		NONE	200	TAKEOFF	0					ATO			
10/21/86	226	1	55		NONE	200	TAKEOFF						ATB			
10/21/86	227	1	55		NONE	200	TAKEOFF		145				NONE			
10/23/86	62	1	21		MULT BIRDS	200	TAKEOFF									
10/25/86	236	2	70		NONE	300	TAKEOFF			VFR			DIV		SEVERAL	
10/26/86	8	2	11		MULT ENG	300	TAKEOFF			VFR			DIV		SEVERAL	
10/26/86	9	2	11		MULT ENG-BIRDS	300	TAKEOFF									
10/28/86	10	1	12		MULT ENG-BIRDS	200	APPROACH									
10/28/86	11	1	13		NONE	300	UNKNOWN									
10/29/86	11	1	13		NONE	300	TAKEOFF	0	130	VFR	DAY	PARTLY CLOUD	NONE	YES	FLOCK	
10/29/86	12	1	14		NONE	300	CLIMB	0	90				ATB		SEVERAL	
10/30/86	225	1	55		NONE	200	TAKEOFF	0	20				NONE		NO	
11/01/86	423	2	1		NONE	200	LANDING									
11/02/86	423	2	1		NONE	200	TAKEOFF									
11/03/86	14	1	13		NONE	300	UNKNOWN						ATB		NO	
11/04/86	15	2	16		NONE	300	TAKEOFF	0	<100	VFR		OVERCAST	NONE	NO	NO	
11/04/86	73	2	55		NONE	200	TAKEOFF	0	145							
11/04/86	161	1	70		NONE	200	TAKEOFF									
11/07/86	16	1	15		NONE	200	UNKNOWN									
11/07/86	74	1	55		NONE	200	LANDING									
11/09/86	17	1	17		NONE	300	UNKNOWN									
11/09/86	18	2	18		NONE	300	APPROACH									
11/10/86	19	2	19		NONE	300	UNKNOWN									
11/10/86	20	1	6	21:13:00	NONE	200	TAKEOFF	100		VFR	DARK	CLEAR		YES		
11/14/86	75	1	55		NONE	200	TAKEOFF	0	145				ATB			
11/14/86	76	1	55		NONE	200	TAKEOFF									
11/15/86	21	1	3	18:30:00	MULT ENG-BIRDS	200	TAKEOFF									
11/15/86	21	2	3	18:30:00	MULT ENG-BIRDS	200	TAKEOFF									
11/15/86	22	2	20		NONE	300	UNKNOWN									
11/15/86	23	2	21		NONE	300	LANDING									
11/18/86	24	2	22		NONE	300	TAKEOFF									
11/20/86	25	1	4	15:51:00	NONE	200	TAKEOFF	0	120	VFR	LIGHT DARK	CLEAR	ATB	NO	YES	SEVERAL
11/22/86	26	1	7	23:08:00	NONE	200	APPROACH	500								
11/23/86	27	1	23		MULT ENG	300	UNKNOWN									
11/23/86	27	2	24		MULT ENG	300	TAKEOFF									
11/23/86	28	1	25		NONE	200	UNKNOWN									
11/24/86	300	2	130		MULT ENG	200	TAKEOFF									
11/24/86	300	2	130		MULT ENG	200	TAKEOFF									
11/26/86	29	1	8	15:50:00	NONE	200	TAKEOFF	0		VFR	LIGHT DARK	CLEAR	OTHER	NO	YES	
11/26/86	30	2	8	19:30:00	NONE	200	LANDING						NONE			
11/27/86	31	1	26		NONE	300	LANDING									
11/29/86	424	1	0		NONE	200	LANDING									
12/03/86	72	1	1060	7:14:00	NONE	200	UNKNOWN									
12/03/86	32	1	14		MULT BIRDS	200	UNKNOWN									
12/08/86	34	1	28	16:00:00	NONE	300	APPROACH	500	180	VFR	DARK	OVERCAST	NONE		FLOCK	
12/12/86	35	2	25	19:00:00	NONE	300	CLIMB	500		IFR		CLEAR RAIN	NONE			
12/13/86	36	1	30		MULT BIRDS	200	UNKNOWN						ATB			
12/13/86	37	2	50		MULT BIRDS	300	UNKNOWN									
12/14/86	31	1	31	15:30:00	NONE	300	CLIMB	1000	190	IFR	DAY	OVERCAST	ATB	NO	FLOCK	
12/14/86	37	2	16		NONE	200	TAKEOFF	0								

EDATE	EVT#	ENG POS	BIRD_NAM	BIRD_SPE	# BIRDS	WT OZ	1	CTY	PRS	AIRPORT	LOCALE	US_INCID	ENGINE	DASH
10/01/86	1									BEG	BELGRADE, YUGOSLAVIA	NO	CFM56	3
10/02/86	2									TVL	LAKE TAHOE, CA	YES	CFM56	3
10/02/86	2									CTU	CHENGOU, CHINA	NO	CFM56	3
10/04/86	235		GULL*		1					XFO	CHINA	NO	JT8D	3
10/05/86	4				1					MDT	HARRISBURG, PA	YES	CFM56	3
10/08/86	5				1					PEK	BEIJING, CHINA	NO	CFM56	3
10/10/86	234				1					XFO	INDIA	NO	JT8D	9A
10/10/86	234		GRAY-HEADED LAPWING	5N20	1					MAN-CDG	MANCHESTER, ENGLAND	NO	CFM56	15
10/13/86	6		GRAY-HEADED LAPWING	5N20	1					XFO	KUNMING, CHINA	NO	CFM56	3
10/13/86	6				1					XFO	KUNMING, CHINA	NO	CFM56	3
10/14/86	232		STARLING	21275	1					BOM	BOMBAY, INDIA	NO	JT8D	3
10/16/86	7		STARLING	21275	1					DAL	DALLAS/FT WORTH, TEX-LOVE	YES	CFM56	3
10/16/86	7				1					DAL	DALLAS/FT WORTH, TEX-LOVE	YES	CFM56	3
10/19/86	230				1					TRV	TRIVANDRUM, INDIA	NO	JT8D	9A
10/19/86	231				1					ELS	EAST LONDON, SOUTH AFRICA	NO	JT8D	17
10/20/86	228				1					XFO	CHINA	NO	JT8D	17
10/20/86	229				1					CCU	CALCUTTA, INDIA	NO	JT8D	17
10/21/86	229				1					XFO	GAUHATI, INDIA	NO	JT8D	17A
10/21/86	227				1					GAU	GUALEQUAYCHU, CHINA	NO	JT8D	17A
10/25/86	236				1					XFO	ORANGE COUNTY, CA	YES	CFM56	3
10/26/86	8		ROCK DOVE	2P1	1					SNA	ORANGE COUNTY, CA	YES	CFM56	3
10/28/86	9		ROCK DOVE	2P1	1					ROA	ROANOAK, VA	YES	JT8D	15
10/28/86	9				1					ROA	ROANOAK, VA	YES	JT8D	15
10/28/86	10				1					DAL	DALLAS/FT WORTH, TEX-LOVE	YES	CFM56	3
10/29/86	11		ROBIN OR PIGEON*	14N36	1					CLT	CHARLOTTE, NC	YES	CFM56	3
10/29/86	12		BLACK-HEADED GULL	5T5	1					BHM	BIRMINGHAM, ALA	YES	CFM56	3
10/30/86	225				1					XFO	INDIA	NO	JT8D	15
11/01/86	13				1					XUS	MIDWAY AIRPORT	YES	JT8D	15
11/02/86	421		NIGHTHAWK		1					MDW	KARACHI, PAKISTAN	YES	JT8D	15
11/03/86	15				1					KHI	ALBANY, NY	YES	CFM56	3
11/04/86	15				1					ALB	HYDERABAD, INDIA	NO	CFM56	3
11/04/86	16				1					HYD	CHRISTCHURCH, NEW ZEALAND	NO	JT8D	15
11/07/86	74				1					XFO	SRIINAGAR, INDIA	NO	JT8D	17A
11/07/86	74				1					SXR	SAN ANTONIO, TEX	YES	CFM56	3
11/09/86	18				1					SAT	DENVER, CO, TEX	YES	CFM56	3
11/10/86	19				1					DEN	CHARLOTTE, NC	YES	CFM56	3
11/10/86	20				1					CLT	PENANG, MALAYSIA	NO	JT8D	15A
11/10/86	20				1					PEN	BANGALORE, INDIA	NO	JT8D	15
11/14/86	75				1					BLR	BHUBANESWAR, INDIA	NO	JT8D	15
11/14/86	76				1					BBI	CHICAGO, IL	YES	JT8D	15
11/15/86	21		ROCK DOVE	2P1	2					ORD	CHICAGO, IL	YES	CFM56	3
11/15/86	21		ROCK DOVE	2P1	2					ORD	CHICAGO, IL	YES	CFM56	3
11/15/86	22		GRAY-HEADED LAPWING	5N20	1					CNS	CAIRNS, OLD, AUSTRALIA	NO	CFM56	3
11/18/86	23				1					AMS	AMSTERDAM, NETHERLANDS	NO	CFM56	3
11/20/86	24				1					DFW	DALLAS/FT WORTH, TEX	YES	CFM56	3
11/22/86	26				1					LTH	LAHORE, PAKISTAN	NO	JT8D	9A
11/22/86	26				1					ARD	KEDAH, MALAYSIA	NO	JT8D	15
11/23/86	27				1					LHE	LAHORE, PAKISTAN	NO	CFM56	3
11/23/86	27				1					LHE	LAHORE, PAKISTAN	NO	CFM56	3
11/24/86	300				1					HOU	HOUSTON, TEX	YES	CFM56	3
11/24/86	300				1					XFO	WELLINGTON, NEW ZEALAND	NO	JT8D	17A
11/26/86	29		BLACK WINGED PLOVER	5M10	1					XFO	WELLINGTON, NEW ZEALAND	NO	JT8D	17A
11/26/86	30		RING BILLED GULL	14N12	1					LLW	LILONGWE, MALAWI	YES	JT8D	7
11/27/86	31				1					LGA	NEW YORK, NY	YES	CFM56	3
11/27/86	31				1					LGA	PORTLAND, ORE	YES	CFM56	3
11/27/86	427				1					PDX	PORTLAND, ORE	YES	JT8D	15
11/29/86	72				1					BLR	BANGALORE, INDIA	NO	JT8D	15
12/02/86	72				1					XFO	CHRISTCHURCH, NEW ZEALAND	NO	JT8D	15
12/03/86	32				1					VDM	ARGENTINA	NO	JT8D	15
12/08/86	34				1					DAL	DALLAS/FT WORTH, TEX-LOVE	YES	CFM56	3
12/12/86	35				1					TFS	TENERIFE	NO	CFM56	3
12/13/86	36				1					AMS	AMSTERDAM, NETHERLANDS	NO	CFM56	3
12/13/86	36				1					AMS	AMSTERDAM, NETHERLANDS	NO	CFM56	3
12/14/86	37		HERRING GULL	14N14	1					XFO	SAN FRANCISCO/OAKLAND, CA	YES	CFM56	3
12/14/86	37				1					CHC	CHRISTCHURCH, NEW ZEALAND	NO	JT8D	15

EDATE	EV#	ENG POS	DNG_CODE	SEVERITY	POW_LOSS	MAX_VIBE	THROTTLE	IFSD	REMARKS
10/01/86	1	2	A,B	3	NONE	2.0	NONE	NO	
10/02/86	1	2	A,B	3	NONE	4.0	NONE	NO	
10/02/86	1	2	A,B	3	NONE		NONE	NO	
10/02/86	233	2	A,G	3	NONE		NONE	NO	AM EVENT, MEDIUM BIRD
10/02/86	233	2	A,H	3	NONE		NONE	NO	
10/03/86	233	2	A,H	3	NONE		NONE	NO	
10/10/86	234	2	A,H	3	NONE		NONE	NO	
10/10/86	234	2	A,C	3	NONE		NONE	NO	CCOC PS4 CRACK
10/13/86	6	6	A,B,E	3	NONE	5.0	IDLE	NO	
10/14/86	234	2	A,B,E	3	NONE		NONE	NO	
10/14/86	234	2	A,B,E	3	NONE		NONE	NO	THUD REPORTED
10/16/86	7	7	A,B,E	3	NONE		NONE	NO	
10/19/86	230	1	A,B,E	3	NONE		NONE	NO	
10/20/86	231	1	A,B,E	3	NONE		NONE	NO	
10/20/86	232	1	A,B,E	3	NONE		NONE	NO	
10/21/86	232	1	A,B,E	3	NONE		NONE	NO	
10/23/86	232	1	A,B,E	3	NONE		NONE	NO	
10/23/86	233	2	A,C	3	NONE	YES	NONE	NO	VIBRATION, THUD, SWELL 7 FAN BLADES REQUIRED LE TIP REPAIR 3 FAN BLADES BENT
10/26/86	8	8	A,H	3	NONE	3.0	NONE	NO	
10/26/86	8	8	A,H	3	NONE		NONE	NO	
10/28/86	10	10	A,H	3	NONE		NONE	NO	
10/28/86	10	10	A,H	3	NONE		NONE	NO	
10/28/86	10	10	A,H	3	NONE		NONE	NO	
10/29/86	11	11	A,C,H	3	NONE	5.0	IDLE	NO	
10/29/86	11	11	A,C,H	3	NONE		NONE	NO	
10/30/86	233	1	A,C,H	3	NONE		NONE	NO	TURBINE FAILED ON 11/10/86
11/01/86	42	13	A,B,H	3	NONE	3.8	NONE	NO	
11/03/86	15	15	A,B,H	3	NONE		NONE	NO	
11/04/86	17	17	A,C	3	NONE		NONE	NO	
11/07/86	161	2	A,C	3	NONE		NONE	NO	
11/07/86	74	17	A,C	3	NONE		NONE	NO	
11/09/86	17	17	A,C	3	NONE		NONE	NO	
11/09/86	18	18	A,C	3	NONE		NONE	NO	
11/10/86	20	20	A,C	3	NONE	4.0	NONE	NO	
11/10/86	20	20	A,C	3	NONE		NONE	NO	
11/14/86	20	20	A,C	3	NONE		NONE	NO	
11/15/86	20	20	A,C	3	NONE		NONE	NO	
11/15/86	21	21	A,C,H	3	NONE		NONE	NO	
11/15/86	21	21	A,C,H	3	NONE		NONE	NO	
11/15/86	21	21	A,C,H	3	NONE		NONE	NO	
11/15/86	21	21	A,C,H	3	NONE		NONE	NO	
11/20/86	22	22	A,B,C,H	3	NONE	5.0	IDLE	NO	SMALL BIRD
11/20/86	22	22	A,B,C,H	3	NONE		NONE	NO	
11/23/86	24	24	A,B,C,H	3	NONE		NONE	NO	
11/23/86	24	24	A,B,C,H	3	NONE		NONE	NO	
11/23/86	24	24	A,B,C,H	3	NONE		NONE	NO	
11/23/86	24	24	A,B,C,H	3	NONE		NONE	NO	
11/24/86	28	28	A,B,H	3	NONE	HIGH	NONE	NO	
11/24/86	300	300	A,B,H	3	NONE		NONE	NO	
11/26/86	300	300	A,B,H	3	NONE		NONE	NO	
11/26/86	300	300	A,B,H	3	NONE		NONE	NO	
11/27/86	42	13	A,C,G	3	NONE		NONE	NO	ODOOR ODOOR ODOOR IN CABIN
11/27/86	42	13	A,C,G	3	NONE		NONE	NO	
11/27/86	42	13	A,C,G	3	NONE		NONE	NO	
11/27/86	42	13	A,C,G	3	NONE		NONE	NO	
11/27/86	42	13	A,C,G	3	NONE		NONE	NO	</

DATA SOURCES: ENGINE MANUFACTURER OR ICAO

EDATE	EVT#	ENG POS	MFG NO	ETIME	SIGN EVT	AIRCRAFT	POF	ALTITUDE	SPEED	FL RULES	COND	WEATHER	CREW AC	CREW AL	BIRD	SEE
12/14/86	80	2	1074		NONE	200	UNKNOWN			IFR	DAY	OVERCAST				
12/14/86	457	2		0	NONE	300	CLIMB		1000	210				NO		NO
12/15/86	38	1	55		NONE	200	TAKEOFF		200	0 145			ATB	NO		YES
12/17/86	162	2	46		NONE	200	LANDING									
12/17/86	82	2	55		NONE	200	UNKNOWN									
12/20/86	58	1	79		NONE	200	LANDING		0 90				ATB			
12/24/86	237	2	79		NONE	200	TAKEOFF		0 130							
12/24/86	42	2	10	8:30:00	TRVS	200	CLIMB		500	150		BELOW CLOUDS	ATB			YES
12/31/86	39	2	32	11:39:00	MULT ENG	300	LANDING				LIGHT	BELOW CLOUDS	NONE			
12/31/86	39	2	33	11:39:00	MULT ENG	300	LANDING				LIGHT	BELOW CLOUDS	NONE			
01/02/87	43	1	11		NONE	200	TAKEOFF		0 50				ATO			
01/02/87	301	1	120		NONE	200	LANDING		0 115							
01/04/87	302	1	120		NONE	200	TAKEOFF		0 130							
01/07/87	44	1	871001		MULT BIRDS	300	LANDING									
01/08/87	83	1	55		NONE	200	LANDING		0				NONE			
01/09/87	84	2	55		NONE	200	UNKNOWN									
01/09/87	238	1	110		NONE	200	TAKEOFF		0 130			SCATTERED				
01/09/87	33	1	130		NONE	200	UNKNOWN									
01/09/87	334	1	130		NONE	200	UNKNOWN									
01/10/87	45	1	871002		MULT BIRDS	300	LANDING									
01/16/87	40	1	12		NONE	200	TAKEOFF									
01/17/87	46	1	871003		NONE	300	TAKEOFF		0 -V1			ICY	NONE		SEVERAL	
01/17/87	47	2	13	17:30:00	MULT ENG	200	CLIMB		200	150		SCATTERED	ATB		NO	
01/28/87	47	2	871004		MULT ENG	300	LANDING				DUSK					
01/28/87	614	2	871005		NONE	300	LANDING									
01/31/87	87	1	160	12:58:00	NONE	200	TAKEOFF		0 110							
02/06/87	356	1	160		NONE	200	LANDING									
02/06/87	623	1	87	10:40:00	MULT BIRDS	300	TAKEOFF		0							
02/08/87	240	1	40		NONE	200	UNKNOWN									
02/10/87	305	1	130		NONE	200	TAKEOFF									
02/10/87	428	1	0		NONE	200	TAKEOFF		0 140			PARTLY CLOUD	ATB		YES	
02/10/87	429	1	0		NONE	200	TAKEOFF									
02/10/87	458	1	0		NONE	200	TAKEOFF		0 140			PARTLY CLOUD	ATB		YES	
02/10/87	458	2	0		MULT ENG	200	TAKEOFF		0 140			PARTLY CLOUD	ATB		YES	
02/10/87	655	2	87	18:41:00	MULT ENG	200	CLIMB		350			CLOUDY			NO	
02/11/87	85	2	55		NONE	200	UNKNOWN		0 140							
02/13/87	430	2	0	12:52:00	NONE	200	TAKEOFF									
02/13/87	589	2	87	17:45:00	NONE	300	LANDING									
02/17/87	357	1	137		NONE	200	UNKNOWN									
02/17/87	357	1	18	10:30:00	NONE	200	TAKEOFF		35	150			ATB		ONE	
02/17/87	60	1	19	16:00:00	NONE	200	TAKEOFF		0				ATO			
02/21/87	663	1	87		NONE	200	TAKEOFF		0 150							
02/22/87	690	1	87	12:12:00	MULT ENG-BIRDS	200	TAKEOFF		0 150			CLOUDY	NONE		NO	
02/22/87	690	2	87	12:12:00	MULT ENG-BIRDS	200	TAKEOFF		0 150			CLOUDY	NONE		NO	
02/23/87	61	2	100	10:30:00	NONE	200	CLIMB		15000	350		SCATTERED	NONE		NO	
02/25/87	241	1	100	11:55:00	NONE	200	TAKEOFF		0 145						YES	
02/27/87	49	1	871006		NONE	300	CLIMB									
02/27/87	262	2	100	6:10:00	NONE	200	LANDING		0 100			RAIN	NONE		SEVERAL	
02/28/87	86	2	130	7:30:00	NONE	200	TAKEOFF		0			CLOUDY	ATB			
03/02/87	306	2	87	16:20:00	NONE	200	UNKNOWN		0 120			CLEAR	NONE		NO	
03/02/87	667	2	87		NONE	200	TAKEOFF					CLEAR	NONE		NO	
03/07/87	590	1	87	6:35:00	MULT BIRDS	300	LANDING					CLEAR	NONE		NO	
03/10/87	50	1	871007		NONE	200	LANDING		100	124		OVERCAST	NONE		NO	
03/11/87	358	1	160		NONE	200	UNKNOWN									
03/12/87	359	2	87	7:09:00	MULT BIRDS	300	TAKEOFF		50	125		CLOUDY	NONE		YES	
03/12/87	595	1	22	15:20:00	NONE	200	TAKEOFF					CLEAR	NONE		NO	
03/13/87	63	2	55		NONE	200	UNKNOWN									
03/16/87	87	2	87	21:00:00	NONE	200	LANDING		0			CLOUDY	NONE		NO	
03/17/87	647	1	55	7:45:00	NONE	200	TAKEOFF		400							
03/18/87	88	2	871008		NONE	200	UNKNOWN									
03/19/87	52	1	871009	13:50:00	NONE	300	APPROACH									
03/21/87	53	1	871010	19:00:00	NONE	300	LANDING		1200	150		CLEAR	NONE		NO	
03/21/87	53	1	871010	19:00:00	NONE	300	TAKEOFF		0 150			CLEAR	ATB			
03/21/87	89	1	55	15:00:00	NONE	200	UNKNOWN									

DATA SOURCES: ENGINE MANUFACTURER OR ICAO

EDATE	EVT#	ENG_POS	BIRD_NAM	BIRD_SPE	#_BIRDS	WT_OZ_1	CTY_PRS	AIRPORT	LOCALE	US_INCID	ENGINE	DASH
12/14/86	80	2	GULL*		1			CHC	CHRISTCHURCH, NEW ZEALAND	NO	JT8D	15
12/14/86	457	2			1			SFO	SAN FRANCISCO, CA	YES	CFM56	3
12/15/86	81	2	MALLARD		1			MAD	MADRID, SPAIN	NO	JT8D	
12/17/86	38	2			1	40.		MSO	MISSOULA, MT	YES	JT8D	
12/17/86	162	2			1			XFO		NO	JT8D	
12/19/86	82	2			1			TRV	TRIVANDRUM, INDIA	NO	JT8D	9A
12/20/86	58	1			1			CHC	CHRISTCHURCH, NEW ZEALAND	NO	JT8D	12
12/24/86	237	2	HERRING GULL		1	40.	ORD-MSY	XFO	BRAZIL	NO	JT8D	17A
12/26/86	42	2			1			HOU	CHICAGO, IL	YES	CFM56	7
12/31/86	39	3			1			HOU	HOUSTON, TEX	YES	CFM56	3
01/02/87	39	3			1			FAT	FRESNO, CA	YES	JT8D	17
01/02/87	301	1			1			FAT	FRESNO, CA	NO	JT8D	
01/02/87	302	1			1			OKA-MMY	MIYAKO JIMA, JAPAN	NO	JT8D	
01/07/87	44	1			2			MMY-OKA	MELBOURNE, AUSTRALIA	NO	JT8D	3
01/08/87	83	1			1			MEL	MELBOURNE, AUSTRALIA	NO	CFM56	
01/09/87	84	2			1			JAI	JAIPUR, INDIA	NO	JT8D	
01/09/87	238	1			1			VNS	VARANASI, INDIA	NO	JT8D	
01/09/87	303	1			1			MAN	MANCHESTER, ENGLAND	NO	JT8D	
01/09/87	304	1			1			AKL	AUCKLAND, NEW ZEALAND	NO	JT8D	
01/10/87	45	1			1			-CHC	CHRISTCHURCH, NEW ZEALAND	NO	JT8D	
01/16/87	40	1	CROW*		1			LST	LAUNCESTON, TASMANIA	NO	CFM56	3
01/16/87	40	1	HORNED LARK		1			OAK	SAO FRANCISCO, CA-OAKLAND	YES	CFM56	17
01/17/87	46	1			1	1.5	OAK-NR	MUC	MUNICH, GERMANY	NO	CFM56	3
01/19/87	41	2	CANADIAN GOOSE		2			RNO	RENO, NEV	YES	CFM56	17
01/28/87	47	1			1	128.	RNO-DEN	TGD	TITOGRAD, YUGOSLAVIA	NO	CFM56	3
01/28/87	47	1			1			TGD	TITOGRAD, YUGOSLAVIA	NO	CFM56	3
01/31/87	614	2			1			LCA	LARNACA, CYPRUS	NO	JT8D	17
02/06/87	356	1			1			XFO	SOUTH AFRICA	NO	CFM56	15
02/06/87	623	2			1			FRA	FRANKFURT, GERMANY	NO	JT8D	
02/08/87	240	1			1			XFO	AUCKLAND, NEW ZEALAND	NO	JT8D	9
02/10/87	305	1			1			AKL	SAN JOSE, CA	YES	JT8D	9
02/10/87	428	1			1			SJC	SAN JOSE, CA	YES	JT8D	15
02/10/87	428	1			1			MDW	MIDWAY, ILL	YES	JT8D	15
02/10/87	458	1			1			MDW	MIDWAY, ILL	YES	JT8D	15
02/10/87	458	2			1			ETNN	SHANWICK, IRELAND	NO	JT8D	
02/10/87	655	2			1			TRV	TRIVANDRUM, INDIA	NO	JT8D	
02/11/87	85	2			1			HAM	HAMBURG, GERMANY	NO	CFM56	3
02/13/87	430	2			1			CBR	CANBERRA, AUSTRALIA	NO	CFM56	3
02/13/87	589	2			1			XFO	ARGENTINA	NO	JT8D	9A
02/14/87	357	1			1			OGG	KAHULUI, MAUI, HAWAII	YES	JT8D	9A
02/17/87	59	1	GOLDEN PLOVER		1		6.	DUR-PLZ	DURBAN, SOUTH AFRICA	NO	JT8D	17A
02/21/87	60	1			1			OGG	KAHULUI, MAUI, HAWAII	YES	JT8D	
02/21/87	663	1	KITE*		1			OPRN	PORTLAND, ORE	YES	JT8D	
02/22/87	690	1	KITE*		1			PIE	CLEARWATER, FL	YES	JT8D	
02/22/87	690	2	KITE*		1			PIE	CLEARWATER, FL	YES	JT8D	
02/23/87	61	2	GLAUCOUS WINGED GULL		1		56.	PDX	PORTLAND, ORE	YES	JT8D	7
02/25/87	241	1			1			MUC	MUNICH, GERMANY	NO	JT8D	3
02/27/87	49	1			1			ALB	ALBANY, NY	YES	CFM56	15
02/27/87	242	2			1			STR	STUTTGART, GERMANY	NO	JT8D	15
02/28/87	86	2	BLACK-BACKED GULL		1		31.	CHC	CHRISTCHURCH, NEW ZEALAND	NO	JT8D	
03/02/87	306	2			1			XFO	CHRISTCHURCH, NEW ZEALAND	NO	JT8D	
03/02/87	667	2	GULL*		1			FNC	FUNCHAL, MADEIRA, PORTUGAL	NO	JT8D	
03/03/87	460	1			1			PIE	ST PETERSBURG, FL	YES	JT8D	
03/07/87	590	1	TRUE SPARROW*		1			ABG	COOLANGATTA, AUSTRALIA	NO	CFM56	3
03/10/87	50	1	SHORE (HORNED) LARK		1		1.5	PEK	BEIJING, CHINA	NO	CFM56	3
03/11/87	358	1			1			OAK	SAN FRANCISCO, CA-OAKLAND	YES	JT8D	
03/11/87	358	2			1			XFO	SAN FRANCISCO, CA-OAKLAND	YES	JT8D	17A
03/12/87	359	1			1			TSV	TOWNSVILLE, AUSTRALIA	NO	JT8D	3
03/12/87	595	1	HAWK*		1			LH-HNL	LINUE, KAUAI, HAWAII	YES	CFM56	9A
03/13/87	63	2			1			IXB	BAGDARA, INDIA	NO	JT8D	
03/16/87	87	2			1			BDQ	VADODARA, INDIA	NO	JT8D	
03/16/87	647	1	BLACK-HEADED GULL		1		10.	BAH-DHA	BAHRAIN, BAHRAIN	NO	JT8D	15
03/17/87	64	1			1			JAI	JAIPUR, INDIA	NO	JT8D	
03/18/87	88	2			1			SYD	SIDNEY, NSW AUSTRALIA	NO	CFM56	3
03/19/87	51	1			1			ZRH	ZURICH, SWITZERLAND	NO	CFM56	3
03/21/87	53	1	DUCK OR GOOSE*		1			MSP	MINN./ST. PAUL, MINN	YES	CFM56	9A
03/21/87	65	1			1			PIE	ST. PETERSBURG, FL	YES	JT8D	17
03/21/87	89	1	GULL*		1			PAT	PATNA, INDIA	NO	JT8D	

DATA SOURCES: ENGINE MANUFACTURER OR ICAO

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DATA SOURCES: ENGINE MANUFACTURER OR ICAO

EDATE	EVT#	ENG	POS	MFG	NO	ETIME	SIGN	EVT	AIRCRAFT	POF	ALTITUDE	SPEED	FL	RULES	LT	COMDS	WEATHER	CREW	AC	CREW	AL	BIRD	SEE	
03/21/87	90	2	1	871011	50		MULT	BIRDS	200	UNKNOWN									NONE					
03/23/87	54	1	1	871011	120		NONE		300	UNKNOWN														
03/25/87	307	2	1			18:35:00	INV	POW LOSS	200	TAKEOFF		0 120					RAIN	ATB				YES		
03/26/87	66	1	1		26		NONE		200	LANDING		0 139					CLEAR					NO		
03/26/87	67	1	1		25	20:17:00	MULT	ENG-BIRDS	200	CLIMB		0 80					CLEAR	ATB			NO			
03/26/87	627	2	2		87	20:17:00	MULT	ENG-BIRDS	200	CLIMB		700 160					CLEAR	ATB			NO			
03/27/87	91	2	2		50		NONE		200	UNKNOWN												ONE		
03/27/87	664	2	2		87	7:08:00	NONE		200	CLIMB		6000					CLOUDY	ATB						
03/28/87	55	2	2		871012		NONE		200	TAKEOFF		1000					CLEAR	NONE				ONE		
03/29/87	36	2	2		36		NONE		200	TAKEOFF		0 145							ATB					
03/29/87	243	2	2		170	12:47:00	NONE		200	LANDING		0 114					SCATTERED				NO			
03/29/87	360	2	2		871013	10:47:00	NONE		200	LANDING		0 114												
03/30/87	56	2	1		130		NONE		200	TAKEOFF								ATB						
03/30/87	308	2	2		0		NONE		200	UNKNOWN														
03/31/87	425	2	2		87	9:30:00	NONE		200	TAKEOFF		0 90					CLOUDY	ATO						
03/31/87	684	2	2		27	14:10:00	MULT	BIRDS	200	TAKEOFF		0 40					SCATTERED	ATO						
04/01/87	684	2	2		100	9:00:00	NONE		200	TAKEOFF								NONE						
04/03/87	244	2	2		130		NONE		200	TAXI								NONE						
04/03/87	309	2	2		110	23:59:00	NONE		200	TAKEOFF		10 140					SCATTERED	OTHER						
04/05/87	245	2	2		87		NONE		200	CLIMB		0 140					CLEAR	ATO						
04/06/87	657	2	2		35		NONE		200	LANDING		0 90					SCATTERED	NONE						
04/07/87	93	2	2		140		NONE		200	UNKNOWN														
04/07/87	361	2	1		87	13:00:00	NONE		200	LANDING		200 140					OVERCAST	NONE						
04/08/87	665	2	1		872001	19:40:00	NONE		200	TAKEOFF		0 -V1					CLEAR	DIV						
04/09/87	106	2	1		872002	22:30:00	NONE		200	CLIMB		600 160					CLEAR	NONE						
04/11/87	107	1	2		100		MULT	BIRDS	200	APPROACH		100 140					SCATTERED	NONE			YES			
04/12/87	246	1	2		87	10:50:00	NONE		200	TAKEOFF														
04/14/87	108	1	2		872003		NONE		200	UNKNOWN		200 175					CLEAR	NONE				ONE		
04/14/87	681	2	2		87	11:15:00	NONE		200	TAKEOFF														
04/17/87	109	2	2		872004		NONE		200	UNKNOWN														
04/21/87	70	1	1		29		TRVS		200	TAKEOFF		0 130					CLEAR	ATB			NO			
04/22/87	247	2	2		110	8:03:00	NONE		200	CLIMB		210					CLEAR				NO			
04/23/87	248	2	2		130	10:38:00	NONE		200	TAKEOFF		0 110										YES		
04/26/87	311	2	2		130		NONE		200	UNKNOWN														
04/26/87	660	1	2		87	20:05:00	MULT	BIRDS	200	LANDING		0						NONE						
05/01/87	312	1	1		130		NONE		200	UNKNOWN														
05/01/87	362	1	1		160		NONE		200	UNKNOWN														
05/03/87	69	2	1		28	18:38:00	NONE		200	TAKEOFF		0 150						ATB						
05/04/87	110	2	1		872005	20:00:00	NONE		200	TAKEOFF		0 +V1						NONE						
05/06/87	591	1	1		87	20:38:00	MULT	BIRDS	200	LANDING		0						NONE						
05/08/87	592	1	1		55		NONE		200	UNKNOWN														
05/10/87	94	1	2		87	20:38:00	NONE		200	LANDING														
05/10/87	111	2	2		872006	22:00:00	NONE		200	TAKEOFF		136					RAIN	NONE				ONE		
05/10/87	622	2	1		87	15:30:00	NONE		200	APPROACH							RAIN	NONE						
05/10/87	687	1	1		55		NONE		200	UNKNOWN							CLOUDY	NONE						
05/12/87	95	1	1		130		NONE		200	UNKNOWN														
05/12/87	363	2	2		130		NONE		200	UNKNOWN														
05/16/87	364	2	2		130		NONE		200	UNKNOWN														
05/17/87	313	2	2		130		NONE		200	LANDING														
05/18/87	249	1	2		110	13:40:00	MULT	BIRDS	200	APPROACH		300 140					SCATTERED	ATO				YES		
05/20/87	250	2	2		110	8:17:00	MULT	BIRDS	200	TAKEOFF		0 100					CLEAR				NO			
05/22/87	96	1	1		55		NONE		200	UNKNOWN		0 85												
05/22/87	97	1	1		55		NONE		200	TAKEOFF														
05/22/87	98	1	1		50		NONE		200	UNKNOWN														
05/24/87	99	1	1		33	7:35:00	TRVS		200	TAKEOFF		0 140					OVERCAST	ATB			YES			
05/25/87	251	2	2		110	6:30:00	NONE		200	LANDING		0 90					CLEAR	NONE			NO			
05/25/87	164	2	2		51	8:53:00	NONE		200	TAKEOFF		15									NO			
05/26/87	252	2	2		110	16:00:00	NONE		200	APPROACH		300					CLEAR				YES			
05/27/87	314	2	2		130		NONE		200	UNKNOWN														
05/28/87	100	2	2		50		NONE		200	UNKNOWN														
05/28/87	100	2	1		52	20:30:00	NONE		200	APPROACH		300 150					SCATTERED				YES			
05/28/87	165	2	2		872007		NONE		200	UNKNOWN														
05/29/87	112	2	2		100	10:50:00	NONE		200	APPROACH		82 140					CLEAR				NO			
05/30/87	253	2	2		100		NONE		200	TAKEOFF		0 110												
05/31/87	254	2	2		872008	17:06:00	NONE		200	APPROACH		150 135					CLEAR	NONE			YES			
05/31/87	254	2	2		100		NONE		200	TAKEOFF														

DATE	EVT#	ENG POS	BIRD NAM	BIRD SPE	# BIRDS	WT OZ	1	CTY	PRS	AIRPORT	LOCALE	US	INCID	ENGINE	DASH
03/21/87	90	2								XFO	QUETTA, PAKISTAN	NO		JT8D	
03/23/87	54	1								UET	QUETTA, PAKISTAN	NO		CFM56	3
03/25/87	307	2								MMY	MIYAKO JIMA, JAPAN	NO		JT8D	
03/26/87	66	1	SPOTTED THICK-KNEE	9N4	1	15.				MMY-OKA	JOHANNESBURG, SOUTH AFRICA	NO		JT8D	17A
03/26/87	67	1								JNB-DUR	JOHANNESBURG, SOUTH AFRICA	NO		JT8D	17A
03/26/87	627	1								JNB-WOH	JOHANNESBURG, SOUTH AFRICA	NO		JT8D	
03/26/87	627	2								BNJ	BOHN, GERMANY	NO		JT8D	
03/26/87	91	1								BNJ	BOHN, GERMANY	NO		JT8D	
03/27/87	664	2								XFO	LAHORE, PAKISTAN	NO		JT8D	
03/28/87	35	2								LHE	LAHORE, PAKISTAN	NO		JT8D	
03/28/87	35	2								FLL	FT LAUDERDALE/HOLLYWOOD, FL	YES		CFM56	3
03/29/87	92	2								AKL	AUCKLAND, NEW ZEALAND	NO		JT8D	15
03/29/87	243	2								XFO	GERMANY	NO		JT8D	
03/29/87	360	2								NCE	NICE, FRANCE	NO		JT8D	15
03/30/87	56	1								AKL	AUCKLAND, NEW ZEALAND	YES		CFM56	3
03/30/87	308	2								XFO	AUCKLAND, NEW ZEALAND	YES		JT8D	
03/31/87	425	2								XUS	LONDON-HEATHROW, ENGLAND	YES		CFM56	3
04/01/87	684	2								LHR	LONDON-HEATHROW, ENGLAND	NO		JT8D	17A
04/03/87	244	2	SWALLOW*		1					PLZ-LON	PORT ELIZABETH, S. AFRICA	NO		JT8D	
04/03/87	309	2	COMMON BLACKBIRD	41Z269	1	2.8				FRA	FRANKFURT, GERMANY	NO		JT8D	
04/03/87	309	2								CHC	CHRISTCHURCH, NEW ZEALAND	NO		JT8D	
04/04/87	245	2								KCH	KUCHING, MALAYSIA	NO		JT8D	
04/04/87	657	2								HKNA	JOMO KEAYATTA, KENYA	NO		JT8D	
04/07/87	93	2								CCU	CALCUTTA, INDIA	NO		JT8D	17
04/07/87	361	2								XFO	CAIRO, EGYPT	NO		JT8D	15
04/08/87	665	2								FAO	FAIRO, PORTUGAL	NO		JT8D	
04/09/87	106	1								CPH	COPENHAGEN, DENMARK	NO		CFM56	3
04/11/87	107	1								SYD-MEL	SYDNEY, NSW, AUSTRALIA	NO		CFM56	3
04/12/87	246	2								TSH	ZAKINTHOS, GREECE	NO		JT8D	
04/12/87	596	1								TSV	TOWNSVILLE, AUSTRALIA	NO		CFM56	3
04/14/87	108	1								FRA	FRANKFURT, GERMANY	NO		CFM56	3
04/14/87	681	2								BHX	BIRMINGHAM, ENGLAND	NO		UNK	
04/17/87	109	2	HOUSE SPARROW	70Z12	1	1.				DAL	DALLAS/FT. WORTH, TEX-LOVE	YES		CFM56	3
04/21/87	70	1	AMERICAN KESTREL	5K26	1	4.				XFO	FAIRO, PORTUGAL	NO		JT8D	17A
04/22/87	247	2	ROCK DOVE	2P1	1	14.				MAN	MANCHESTER, ENGLAND	NO		JT8D	
04/23/87	248	2								WLG	WELLINGTON, NEW ZEALAND	NO		JT8D	
04/26/87	311	1								WLG-DUD	WELLINGTON, NEW ZEALAND	NO		JT8D	
04/26/87	660	1								AMS	AMSTERDAM, NETHERLANDS	NO		CFM56	3
05/01/87	312	1								AKL	AUCKLAND, NEW ZEALAND	NO		JT8D	
05/01/87	362	2								PTE	PETERBURG, FL	YES		JT8D	15A
05/03/87	69	1								PTE-YYZ	ST. PETERSBURG, FL	YES		JT8D	9A
05/04/87	110	1								SAT-HOU	SAN ANTONIO, TEX	YES		CFM56	3
05/06/87	591	1								DRW	DARWIN, AUSTRALIA	NO		CFM56	3
05/08/87	592	1	AUSTRALIAN COURSER	10N9	*	2.5				SYD	SYDNEY, AUSTRALIA	NO		CFM56	3
05/10/87	92	1	GULL*		1					JRH	JORHAT, INDIA	NO		JT8D	
05/10/87	111	2								LIT-HOU	LITTLE ROCK, ARK	YES		CFM56	3
05/10/87	622	1								EMA	FRANCE	NO		JT8D	
05/10/87	687	1								BOM	EAST MIDLANDS, ENGLAND	NO		JT8D	
05/12/87	95	1								XFO	BOMBAY, INDIA	NO		JT8D	15A
05/12/87	363	1								CHC	CHRISTCHURCH, NEW ZEALAND	NO		JT8D	15
05/16/87	364	2								LHR	LONDON-HEATHROW	NO		JT8D	
05/17/87	373	1								BLR	BANGALORE, INDIA	NO		JT8D	15
05/18/87	249	2								VNS	VARANASI, INDIA	NO		JT8D	
05/20/87	250	1								XFO	LAGOS, NIGERIA	NO		JT8D	15
05/22/87	97	1								LOS	EAST LONDON, SOUTH AFRICA	NO		JT8D	
05/22/87	98	1								FLS	COLOGNE/BONN, GERMANY	NO		JT8D	15
05/24/87	251	1	CATTLE EGRET	1135	1	16.				CGN	KUALA LUMPUR, MALAYSIA	NO		JT8D	
05/25/87	164	2	HADADA IBIS	6112	1	48.				KUL	CHISTCHURCH, NEW ZEALAND	NO		JT8D	
05/26/87	352	1	SPARROW*		1	3.				CHC	CHRISTCHURCH, NEW ZEALAND	NO		JT8D	
05/27/87	314	2								FRA	FRANKFURT, GERMANY	NO		JT8D	15
05/28/87	100	2								AMS	AMSTERDAM, NETHERLANDS	NO		CFM56	3
05/28/87	165	2	SWALLOW*		1					ALG	ALGIERS, ALGERIA	NO		JT8D	15
05/30/87	112	1								TNG	TANGER, MOROCCO	NO		CFM56	3
05/31/87	253	1								DUB	DUBLIN, IRELAND	NO		JT8D	

DATA SOURCES: ENGINE MANUFACTURER OR ICAO

EDATE	EV#	ENG POS	DNG CODE	SEVERITY	POW LOSS	MAX VIBE	THROTTLE	IFSD	REMARKS
03/21/87	90		A,D,E	9	NONE		NONE	NO	
03/21/87	54			2				NO	
03/21/87	307			3	COMPRESSOR	HIGH	CUTOFF	NO	INVOLUNTARY RPM ROLLED BACK BELOW IDLE THEN SHUTDOWN
03/21/87	64		A,D,H	3	NONE		NONE	NO	
03/21/87	627		A,C	4				NO	MEDIUM BIRD, MINOR DAMAGE
03/21/87	627		A,C	4				NO	MEDIUM BIRD, MINOR DAMAGE
03/21/87	627		A,C	4				NO	SMALL BIRD
03/21/87	645			2				NO	
03/21/87	645		A,D	2	NONE		NONE	NO	
03/21/87	645		A,D,H	2				NO	
03/21/87	243			9				NO	
03/21/87	360			3				NO	
03/21/87	360		A,H	3	NONE		NONE	NO	
03/30/87	308			9				NO	
03/31/87	425			9	COMPRESSOR		IDLE	NO	SMALL BIRD
03/31/87	648			9				NO	
04/01/87	349			9				NO	
04/03/87	349			9				NO	
04/03/87	245			9				NO	
04/05/87	257			9				NO	MEDIUM BIRD
04/07/87	93			3				NO	
04/07/87	361		A,C	3				NO	SMALL BIRD
04/08/87	645			3				NO	
04/09/87	105		A,H	3	NONE	3.9		NO	
04/11/87	107		A,C	3	NONE			NO	
04/12/87	246		A,C	9				NO	
04/14/87	506			9				NO	
04/14/87	108			9				NO	SMALL BIRD
04/17/87	681			9				NO	
04/17/87	109			1	NONE			NO	
04/21/87	170		A,G,I,K	1	COMPRESSOR			NO	
04/22/87	247		A,C	3				NO	
04/23/87	340			9				NO	
04/28/87	310			9				NO	SMALL BIRD
04/28/87	311			9				NO	ODOR
04/28/87	640			9				NO	SMALL BIRD
05/01/87	312			2				NO	
05/01/87	340		A,G	2	COMPRESSOR		NONE	NO	
05/03/87	110			9	NONE			NO	SMALL BIRD
05/03/87	110			9				NO	MEDIUM BIRD
05/08/87	591		A,H	3				NO	
05/10/87	592			9				NO	
05/10/87	111			9				NO	
05/10/87	682			9				NO	
05/12/87	363		A,C	3				NO	3 FAN BLADES DAMAGED
05/12/87	363		A,C	3				NO	LARGE BIRD
05/16/87	313			9				NO	
05/18/87	240			9				NO	
05/20/87	593		A,H	3	COMPRESSOR			NO	POWER LOSS
05/20/87	593			9				NO	
05/22/87	593		A,I,K,M	1	COMPRESSOR			NO	COMPLETE FRAC OF #2 BEARING RET BOLTS
05/24/87	251			9				NO	
05/24/87	162			9	NONE			NO	MEDIUM BIRD
05/24/87	314			9				NO	
05/28/87	109		A,H	3				NO	
05/28/87	109			9				NO	
05/28/87	165			9	NONE			NO	
05/28/87	112			9	NONE			NO	EVENT OCCURED DURING GO-ROUND
05/30/87	213			9				NO	SMALL BIRD
05/31/87	213		A,D	2	NONE	3.8		NO	

DATA SOURCES: ENGINE MANUFACTURER OR ICAO

EDATE	EVT#	ENG_POS	MFG_NO	ETIME	STGN	EVT	AIRCRAFT	POF	ALTITUDE	SPEED	FL RULES	LT_CONDS	WEATHER	CREW_AC	CREW_AL	BIRD_SEE
														ATO	NO	YES
06/02/87	71	1	30	16:05:00	NONE		200	TAKEOFF	0	120	VFR		CLEAR			
06/03/87	315	1	120		NONE		200	LANDING	50	+V1				NONE		
06/04/87	114	1	872009	14:45:00	NONE		300	TAKEOFF								
06/05/87	115	2	872010		NONE		300	LANDING	0	80			CLEAR			
06/05/87	694	2	872011	10:00:00	NONE		300	CRUISE					CLOUDY			SEVERAL
06/08/87	116	1	87	7:48:00	BIRDS		300	LANDING	150	125			CLOUDY			SEVERAL
06/08/87	662	1	100	20:20:00	NONE		200	TAKEOFF	0	120	VFR		SCATTERED	ATO	YES	SEVERAL
06/09/87	255	1	31	16:10:00	NONE		200	LANDING	0	120						YES
06/10/87	608	1	87	10:40:00	NONE		200	LANDING	12	120						ONE
06/10/87	101	1	87	1:25:00	NONE		200	TAXI	0	12			CLEAR	NONE	NO	SEVERAL
06/11/87	677	2	87		NONE		UNK						CLEAR	NONE	NO	SEVERAL
06/13/87	117	1	872012	4:03:00	ENG		300	TAKEOFF	0	+V1			CLEAR	ATB		YES
06/13/87	256	2	110	4:03:00	ENG		200	TAKEOFF	0				SCATTERED			YES
06/13/87	345	1	170		NONE		200	TAKEOFF	0	130						
06/14/87	345	1	120		NONE		200	UNKNOWN								
06/15/87	347	1	110	16:45:00	NONE		200	TAKEOFF	0	130			CLEAR		NO	YES
06/17/87	118	2	872013		NONE		300	UNKNOWN								
06/17/87	317	2	120		NONE		300	UNKNOWN								
06/19/87	119	1	872014	9:09:00	NONE		300	UNKNOWN	50	140	VFR	DAY	PARTLY CLOUD	NONE	NO	FLOCK
06/19/87	609	2	87	9:12:00	NONE		300	TAKEOFF	0	110			SCATTERED	NONE	NO	SEVERAL
06/22/87	166	1	53	15:45:00	NONE		200	CLIMB	500		VFR					ONE
06/23/87	258	1	100		NONE		200	APPROACH	114				CLOUDY	NONE	NO	FLOCK
06/23/87	674	1	87	18:35:00	MULT		200	TAKEOFF	0	140						ONE
06/24/87	675	2	87	4:40:00	NONE		200	CLIMB	3000	230			OVERCAST	NONE	NO	ONE
06/24/87	882	2	87	10:07:00	NONE		200	CLIMB	500	170			CLEAR	NONE	NO	ONE
06/25/87	102	2	34	12:56:00	NONE		200	LANDING	0	90						
06/27/87	103	1	32		NONE		200	UNKNOWN								
06/27/87	259	1	110	10:07:00	NONE		200	LANDING	0	110			SCATTERED	ATB	NO	SEVERAL
06/28/87	371	2	130	15:18:00	MULT	BIRDS	200	TAKEOFF	0				RAIN	OTHER	NO	SEVERAL
06/28/87	627	1	87		NONE		200	LANDING						ATB	NO	ONE
06/30/87	628	2	0		NONE		200	CLIMB						ATB	NO	ONE
06/30/87	629	2	87	7:50:00	NONE		200	LANDING	50	135						ONE
07/01/87	629	2	87	17:36:00	NONE		300	TAKEOFF	10	135			CLEAR	NONE	NO	SEVERAL
07/02/87	366	1	80	14:15:00	NONE		200	APPROACH	80	120			SCATTERED			YES
07/02/87	431	1	170		NONE		200	UNKNOWN								ONE
07/03/87	319	1	120		NONE		200	TAKEOFF								SEVERAL
07/04/87	261	2	80	15:15:00	NONE		200	LANDING		+V1			SCATTERED	ATB	NO	ONE
07/05/87	135	2	873001	8:25:00	NONE		300	TAKEOFF					CLEAR	NONE	NO	SEVERAL
07/06/87	134	2	873002		NONE		300	UNKNOWN								ONE
07/07/87	104	2	50		NONE		200	UNKNOWN								SEVERAL
07/07/87	104	2	1667		NONE		200	TAKEOFF	0	0				ATO	NO	YES
07/09/87	263	1	873003	0:42:00	NONE		200	CLIMB	3000	170		NIGHT	SCATTERED			NO
07/11/87	135	2	100	12:20:00	NONE		200	LANDING								YES
07/13/87	171	1	58		NONE		200	UNKNOWN								NO
07/13/87	692	1	87		NONE		200	UNKNOWN								
07/13/87	1061	1	1654		NONE		200	LANDING	0					NONE	NO	ONE
07/13/87	1062	1	1665		NONE		200	UNKNOWN						NONE	NO	SEVERAL
07/14/87	136	2	873004		NONE		300	UNKNOWN								SEVERAL
07/14/87	137	2	873005		NONE		300	APPROACH								YES
07/14/87	138	1	873006		NONE		300	TAKEOFF	7000	137	VFR	DAY	CLEAR		NO	NO
07/15/87	263	1	100	9:35:00	NONE		200	TAKEOFF	0	+V1				NONE	NO	NO
07/15/87	1063	1	1666		NONE		200	UNKNOWN						NONE	NO	NO
07/16/87	367	1	130		NONE		200	UNKNOWN								
07/17/87	432	2	170	18:39:00	NONE		200	CLIMB	1000	155						ONE
07/17/87	432	2	87	7:35:00	NONE		200	APPROACH	300	130				ATO	NO	ONE
07/19/87	139	2	873007		NONE		300	TAKEOFF	0	90			CLOUDY		NO	SEVERAL
07/19/87	264	2	100	20:26:00	MULT	BIRDS	100	TAKEOFF	0	130			SCATTERED	NONE	NO	SEVERAL
07/19/87	265	2	87	19:34:00	NONE		200	TAKEOFF	0	+V1			OVERCAST	NONE	NO	SEVERAL
07/21/87	140	2	873008	7:00:00	NONE		300	TAKEOFF	100	125		DAWN	CLEAR		NO	YES
07/21/87	265	2	100	15:20:00	NONE		200	APPROACH	100	125				ATO	NO	ONE
07/21/87	426	2	87		NONE		200	TAKEOFF	100	125			CLEAR		NO	ONE
07/23/87	122	2	44	19:00:00	NONE		200	LANDING	0	110					YES	SEVERAL
07/24/87	606	2	87	18:20:00	MULT	BIRDS	200	TAKEOFF	0	100			CLOUDY	NONE	YES	SEVERAL

DATA SOURCES: ENGINE MANUFACTURER OR ICAO

EDATE	EVT#	ENG POS	BIRD NAM	BIRD SPE	# BIRDS	WT OZ	1	CTY	PRS	AIRPORT	LOCALE	US_INCID	ENGINE	DASH
06/02/87	71	1	GULL*		1			ORF-CVG	ORF	NORFOLK, VA		YES	JT8D	15A
06/03/87	315	1						ISG-MHY	MHY	MIYAKO JIMA, JAPAN		NO	JT8D	
06/04/87	114	1						KGS-GEN	KGS	KOS, GREECE		NO	CFM56	3
06/05/87	115	2	CROW*						GRZ	GRAZ, AUSTRIA		NO	CFM56	3
06/05/87	694	2	VULTURE*						TRV	TRIVANDRUM, INDIA		NO	JT8D	
06/08/87	116	1						SLC	SLC	SALT LAKE CITY, UT		YES	CFM56	3
06/08/87	662	1	GULL*					CHC	CHC	CHRISTCHURCH, NEW ZEALAND		NO	JT8D	
06/09/87	255	1						LDE	LDE	LOURDES, FRANCE		NO	JT8D	
06/10/87	101	1	BLACK KITE					YYC-YXD	YXD	EDMONTON, ALTA-MUN., CANADA		NO	JT8D	9A
06/10/87	608	1							YOH	OTTAWA, CANADA		NO	JT8D	
06/12/87	677	2							BKK	BANGKOK, THAILAND		NO	UNK	3
06/13/87	917	1							LTN	LINZ, AUSTRIA		NO	JT8D	
06/13/87	256	1							LTN	MILAN, ITALY		NO	JT8D	
06/13/87	252	2							MIL	MILAN, ITALY		NO	JT8D	15
06/13/87	365	1						ISG-OKA	ELS	EAST LONDON, SOUTH AFRICA		NO	JT8D	
06/14/87	316	1							IAD	WASHINGTON, DC-DULLES		YES	CFM56	3
06/15/87	257	2							XFO	JAPAN		NO	JT8D	
06/17/87	118	1						OKA-MHY	HRL	HARLINGEN TEX		YES	CFM56	3
06/19/87	119	1	GULL*						FRA	FRANKFURT, GERMANY		NO	JT8D	
06/19/87	609	2	SWALLOW*						CDG	PARIS, FRANCE-DEGAULLE		NO	JT8D	15
06/22/87	166	1	SWALLOW*						PHI	REUS, SPAIN		NO	JT8D	
06/23/87	258	1	COMMON SWIFT						GLA	PALMA MALLORCA, SPAIN		NO	JT8D	
06/23/87	674	1	GULL*						KHH	GLASGOW, SCOTLAND		NO	JT8D	
06/24/87	676	2							TUN	SAN FRANCISCO, CA-OAKLAND		YES	JT8D	9A
06/24/87	682	1	NORTHERN MARSH HARRIER					18. LAS-OAK	14.	KAOHSIUNG, TAIWAN		NO	JT8D	17A
06/25/87	102	2	FERAL PIGEON*						MAD	TUNIS, TUNISIA		NO	JT8D	
06/27/87	103	1							DAY	CHRISTCHURCH, NEW ZEALAND		NO	JT8D	
06/27/87	259	1	SPUR-WINGED PLOVER						TXL	MADRID, SPAIN		YES	JT8D	
06/28/87	671	2							LGSK	W. BERLIN, GERMANY		NO	JT8D	
06/29/87	627	1	RED TAI*						LHR	SKIATHOS, GREECE		NO	CFM56	3
06/30/87	628	2	GULL*						XFO	LONDON, ENGLAND-HEATHROW		NO	JT8D	15
07/01/87	629	2							EZE	HANOVER, GERMANY		NO	JT8D	3
07/02/87	366	1							FRA	TANGER, MOROCCO		NO	CFM56	3
07/02/87	431	1							ORF	BUENOS AIRES, ARGENTINA		NO	JT8D	15
07/03/87	319	1							DEL	FRANKFURT, GERMANY		YES	CFM56	3
07/04/87	261	2							ORF	LOUISVILLE, KY		YES	CFM56	3
07/05/87	133	2							ORF	WASHINGTON, DC-DULLES		NO	JT8D	
07/05/87	134	2							ORF	WASHINGTON, DC-DULLES		NO	JT8D	
07/07/87	104	2							ORF	WASHINGTON, DC-DULLES		NO	JT8D	
07/07/87	1064	1							ORF	WASHINGTON, DC-DULLES		NO	JT8D	
07/09/87	135	2							ORF	WASHINGTON, DC-DULLES		NO	JT8D	
07/11/87	262	1							ORF	WASHINGTON, DC-DULLES		NO	JT8D	
07/13/87	105	1							ORF	WASHINGTON, DC-DULLES		NO	JT8D	
07/13/87	171	2							ORF	WASHINGTON, DC-DULLES		NO	JT8D	
07/13/87	692	1	PARTRIDGE*						ORF	WASHINGTON, DC-DULLES		NO	JT8D	
07/13/87	1061	2							ORF	WASHINGTON, DC-DULLES		NO	JT8D	
07/13/87	1062	1							ORF	WASHINGTON, DC-DULLES		NO	JT8D	
07/14/87	136	2							ORF	WASHINGTON, DC-DULLES		NO	JT8D	
07/14/87	137	2							ORF	WASHINGTON, DC-DULLES		NO	JT8D	
07/14/87	138	1							ORF	WASHINGTON, DC-DULLES		NO	JT8D	
07/15/87	263	1							ORF	WASHINGTON, DC-DULLES		NO	JT8D	
07/15/87	1063	1							ORF	WASHINGTON, DC-DULLES		NO	JT8D	
07/16/87	320	1							ORF	WASHINGTON, DC-DULLES		NO	JT8D	
07/17/87	367	1							ORF	WASHINGTON, DC-DULLES		NO	JT8D	
07/17/87	432	2							ORF	WASHINGTON, DC-DULLES		NO	JT8D	
07/17/87	632	2							ORF	WASHINGTON, DC-DULLES		NO	JT8D	
07/19/87	139	2	KITE*						ORF	WASHINGTON, DC-DULLES		NO	JT8D	
07/19/87	264	2							ORF	WASHINGTON, DC-DULLES		NO	JT8D	
07/19/87	685	1	BLACK KITE						ORF	WASHINGTON, DC-DULLES		NO	JT8D	
07/19/87	140	1							ORF	WASHINGTON, DC-DULLES		NO	JT8D	
07/21/87	265	2							ORF	WASHINGTON, DC-DULLES		NO	JT8D	
07/21/87	426	2							ORF	WASHINGTON, DC-DULLES		NO	JT8D	
07/21/87	615	2							ORF	WASHINGTON, DC-DULLES		NO	JT8D	
07/23/87	122	2							ORF	WASHINGTON, DC-DULLES		NO	JT8D	
07/24/87	606	2	KILLDEER						ORF	WASHINGTON, DC-DULLES		NO	JT8D	

DATA SOURCES: ENGINE MANUFACTURER OR ICAO

DATE	EVT#	ENG POS	DWG CODE	SEVERITY	POW LOSS	MAX VIBE	THROTTLE	IFSD	REMARKS
06/02/87	71		A, D	2				NO	
06/03/87	315			3	NONE			NO	
06/04/87	114		A, H	3	NONE			NO	
06/05/87	115		A, Q	4	NONE			NO	SUBSTANTIAL DAMAGE 2 F BLDG BLENDING MEDIUM BIRD
06/06/87	694		A, B	3				NO	
06/08/87	116			3				NO	
06/08/87	665			3				NO	
06/09/87	235			3	COMPRESSOR			NO	SURGED ON GROUND SMALL BIRD
06/10/87	101			3				NO	
06/10/87	608			3				NO	
06/12/87	677		A, H	3	NONE	5.0	RETARD	NO	
06/13/87	117			3				NO	
06/13/87	256			3				NO	
06/13/87	256			3				NO	
06/13/87	365			3				NO	
06/14/87	316		A, C	3				NO	MEDIUM BIRD
06/15/87	257			3	NONE			NO	
06/17/87	118			3				NO	
06/17/87	317			3	NONE			NO	SMALL BIRD
06/19/87	119			3				NO	
06/19/87	609			3	NONE			NO	
06/22/87	166			3				NO	
06/22/87	236			3				NO	
06/23/87	674		A, Q	3				NO	
06/24/87	676			3				NO	
06/24/87	682			3				NO	
06/25/87	102		A, C, H	3	NONE		RETARD	NO	
06/25/87	103		A, G	3				NO	
06/25/87	259			3				NO	
06/27/87	318		A, C	3				NO	
06/28/87	677			3				NO	LARGE BIRD SMALL BIRD LARGE BIRD MEDIUM BIRD
06/29/87	427			3				NO	
06/30/87	628			3				NO	
07/01/87	629			3				NO	
07/02/87	260			3				NO	
07/02/87	320			3				NO	
07/02/87	321			3				NO	
07/03/87	319			3				NO	
07/04/87	261		A, C	3	NONE	4.9		NO	REPLACED 1 PAIR OF F BLDG
07/05/87	133		A	3	NONE			NO	
07/06/87	134			3				NO	
07/07/87	104			3				NO	
07/07/87	104			3				NO	
07/09/87	135			3	NONE			NO	
07/11/87	262			3				NO	
07/13/87	105		A, G	3	NONE			NO	AIRCRAFT GROUNDED DUE TO FOD FOUND DURING GROUND INSPECTION MEDIUM BIRD
07/13/87	171		A, C, M	3				NO	
07/13/87	692			3				NO	
07/13/87	1061		A, D, M	3				NO	8 FBLDS REPLACED, BLD TANG BROKEN
07/13/87	1062			3				NO	FOUND ON GRD INSPCT
07/14/87	137		A	3	NONE			NO	FOUND ON GRD INSPCT
07/14/87	138			3	NONE			NO	1 F BLD DAMAGED
07/14/87	138			3	NONE			NO	FOUND ON GRD INSPCT, SMALL BIRD
07/15/87	1063			3				NO	
07/16/87	130			3				NO	FOUND ON GRD INSPCT
07/17/87	320			3				NO	
07/17/87	263		A	3				NO	
07/17/87	264			3				NO	
07/19/87	139			3	NONE			NO	MEDIUM BIRD FOUND DURING GROUND INSPECTION
07/19/87	264			3				NO	
07/19/87	685		A, D	3	NONE	3.2		NO	
07/21/87	140			3				NO	
07/21/87	265		A	3	YES			NO	FAN BLADE DAMAGE MEDIUM BIRD
07/23/87	266			3				NO	
07/23/87	612		A, C, H, M	3				NO	SMALL BIRD
07/23/87	122			3				NO	
07/24/87	606			3				NO	

DATA SOURCES: ENGINE MANUFACTURER OR ICAO

EDATE	EVT#	ENG_POS	MFG_NO	ETIME	SIGN_EVT	AIRCRAFT	POF	ALTITUDE	SPEED	FL_RULES	LT_CONDS	WEATHER	CREW_AC	CREW_AL	BIRD_SEE
07/25/87	605	1	87	11:40:00	NONE	200	TAKEOFF	0 50				CLEAR	ATO	NO	FLOCK
07/26/87	123	1	41	18:37:00	NONE	200	TAKEOFF	0 150					ATB	NO	FLOCK
07/26/87	124	1	43	9:00:00	NONE	200	LANDING	100 150		VFR					
07/26/87	141	2	873009	20:37:00	NONE	200	TAKEOFF	0 80				CLEAR		NO	YES
07/26/87	266	2	93	9:00:00	NONE	200	CRUISE	140					ATB	NO	
07/27/87	321	1	87	13:20:00	NONE	200	TAKEOFF	130				CLOUDY	ATO	YES	ONE
07/27/87	325	1	87	17:45:00	NONE	200	TAKEOFF	20 140					NONE		YES
07/27/87	1085	1	1668	17:45:00	NONE	200	UNKNOWN	0 70							
07/29/87	126	1	873010	19:30:00	NONE	200	TAKEOFF	0 130			OVERCAST	RAIN	NONE	NO	SEVERAL
07/29/87	142	1	87	4:55:00	NONE	200	LANDING	0 100		VFR		CLEAR	ATO		
07/30/87	127	1	45	14:16:00	NONE	200	TAKEOFF	10 135				CLOUDY	NONE	NO	SEVERAL
07/30/87	322	2	120	9:55:00	MULT	200	LANDING	500 +V1			BRIGHT	OVERCAST	NONE		SEVERAL
07/31/87	143	1	873011	16:24:00	NONE	200	TAKEOFF	0 128		VFR		OVERCAST	ATB	NO	ONE
07/31/87	144	1	873012	7:01:00	NONE	200	LANDING	0 100				CLEAR	NONE	NO	SEVERAL
08/01/87	624	1	87		NONE	200	UNKNOWN	0 90		VFR	DAY	PARTLY CLOUD	ATO	NO	YES
08/01/87	628	2	38	9:22:00	NONE	200	TAKEOFF	1000 140			BELOW CLOUDS				SEVERAL
08/03/87	128	1	39		NONE	200	UNKNOWN								
08/03/87	162	2	90		NONE	200	LANDING								
08/03/87	205	2	80		NONE	200	APPROACH								
08/03/87	267	2	170		NONE	200	TAKEOFF								
08/04/87	206	1	90		NONE	200	TAKEOFF				DUSK	OVERCAST	NONE		
08/04/87	323	2	130		NONE	200	LANDING						NONE		
08/05/87	145	1	873013		NONE	200	LANDING						NONE		
08/05/87	146	2	873014		MULT	200	UNKNOWN						NONE		
08/05/87	147	1	90		MULT	200	UNKNOWN						NONE		
08/05/87	148	2	170		NONE	200	TAKEOFF	0 130				CLOUDY	NONE	NO	FLOCK
08/05/87	643	1	87	18:10:00	NONE	200	LANDING	0 123			OVERCAST	RAIN	NONE		ONE
08/05/87	649	2	87	8:15:00	NONE	200	TAKEOFF	0 20					NONE		
08/07/87	1067	1	1670		NONE	200	UNKNOWN	0 130					NONE		
08/07/87	1068	1	1671		NONE	200	TAKEOFF	140				CLOUDY	ATB	NO	ONE
08/08/87	1069	2	1669	9:54:00	NONE	200	TAKEOFF	0 130					NONE		
08/12/87	597	2	87	14:10:00	NONE	200	UNKNOWN						NONE		
08/13/87	693	2	90		NONE	200	UNKNOWN						NONE		
08/13/87	208	2	87	10:00:00	NONE	200	LANDING	0 100				CLEAR	NONE	NO	SEVERAL
08/13/87	635	2	87	9:00:00	NONE	200	LANDING	20 135					NONE		ONE
08/13/87	636	2	87	17:50:00	NONE	200	LANDING	0 100				CLEAR	NONE		SEVERAL
08/17/87	130	2	87	15:30:00	NONE	200	UNKNOWN						NONE		ONE
08/17/87	148	2	873017	7:38:00	MULT	200	TAKEOFF	0 100			OVERCAST	RAIN	OTHER	NO	FLOCK
08/18/87	625	2	87	6:18:00	NONE	200	LANDING	0 150				CLEAR	NONE		SEVERAL
08/18/87	629	1	87	15:17:00	MULT	200	TAKEOFF	0 85		VFR			ATO		YES
08/19/87	131	1	47		NONE	200	UNKNOWN								
08/19/87	1069	1	1672		NONE	200	TAKEOFF								
08/20/87	209	1	90		NONE	200	UNKNOWN								
08/22/87	324	1	120		NONE	200	UNKNOWN								
08/22/87	371	1	190		NONE	200	UNKNOWN								
08/22/87	372	1	190		NONE	200	UNKNOWN								
08/22/87	633	2	87	8:15:00	NONE	200	TAKEOFF	0 60				CLEAR	ATO	NO	ONE
08/22/87	650	2	87	13:05:00	NONE	200	APPROACH	1500 170					NONE	NO	SEVERAL
08/22/87	1070	2	1673		NONE	200	TAKEOFF	0 60					ATO		YES
08/22/87	1071	1	1674		NONE	200	APPROACH								
08/23/87	373	1	190		NONE	200	UNKNOWN								
08/23/87	680	1	87	12:00:00	MULT	200	TAKEOFF	0 100				CLEAR	NONE	NO	FLOCK
08/25/87	210	2	90		NONE	200	UNKNOWN								
08/26/87	188	1	75	8:23:00	TRVS	200	LANDING	0 140		VFR		SCATTERED			YES
08/26/87	374	1	170		NONE	200	TAKEOFF	0 135			NIGHT	CLEAR	ATO	NO	NO
08/26/87	451	1	87	6:20:00	MULT	200	TAKEOFF					CLEAR	NONE	NO	SEVERAL
08/27/87	666	1	87	20:00:00	NONE	200	UNKNOWN						ATO		
08/28/87	325	1	0		NONE	200	TAKEOFF								

DATA SOURCES: ENGINE MANUFACTURER OR ICAO

ENGINE	POS	BIRD NAM	ENG POS	BIRD NAM	BIRD SPE	# BIRDS	WT OZ	1	CITY	PRS	AIRPORT	LOCALE	US INCD	ENGINE	DASH
DATE	EVT#														
07/25/87	605	GULL*	1		1				GOA-LGW	YYC	GOA-LGW	CALCARY, ALTA, CANADA	NO	JT8D	15A
07/26/87	123	GLAUCOUS-WINGED GULL	1		14N22				40. YYZ-YGG	GOA	GOA	GENOVA, ITALY	NO	JT8D	9A
07/26/87	141		1						-DUS	DUS	DUS	DUSSELDORF, GERMANY	NO	CFM56	3
07/26/87	266		1							XFO	XFO	PEARSON INTL, CANADA	NO	JT8D	
07/26/87	612		1										NO	JT8D	
07/27/87	321		1										NO	JT8D	
07/27/87	635		1										NO	JT8D	
07/27/87	1065		1										NO	JT8D	
07/29/87	126	SPOTTED DOVE	1		2P65				6. ITO-HNL	AMS	ITO	HILO HAWAII	YES	JT8D	9A
07/29/87	142		1						AMS-	AMS	AMS	AMSTERDAM, NETHERLANDS	YES	CFM56	3
07/29/87	368		2										NO	JT8D	7
07/29/87	619	HAWK*	1										NO	JT8D	15A
07/30/87	127		1										NO	JT8D	
07/30/87	322		1										NO	JT8D	
07/30/87	658	PIGEON*	2										NO	JT8D	
07/30/87	143		1										NO	JT8D	
07/31/87	144	GALAH	1		1015								YES	CFM56	3
07/31/87	624		1										NO	JT8D	3
08/01/87	600		2										NO	JT8D	
08/01/87	128		1										NO	JT8D	
08/03/87	129		1										NO	JT8D	
08/03/87	205		2										NO	JT8D	
08/03/87	267		2										NO	JT8D	
08/03/87	369		2										NO	JT8D	
08/04/87	206		1										NO	JT8D	
08/04/87	323		2										NO	JT8D	
08/05/87	145		1										NO	JT8D	
08/05/87	146		1										NO	JT8D	
08/05/87	146		1										NO	JT8D	
08/05/87	207		1										NO	JT8D	
08/05/87	370		1										NO	JT8D	
08/05/87	643	KITE*	1										NO	JT8D	
08/06/87	147	LAPWING*	1										NO	JT8D	
08/06/87	626		1										NO	JT8D	
08/07/87	649		1										NO	JT8D	
08/07/87	1067		1										NO	JT8D	
08/07/87	1068		1										NO	JT8D	
08/08/87	1066		1										NO	JT8D	
08/12/87	597		1										NO	JT8D	
08/12/87	693		2										NO	JT8D	
08/13/87	208		2										NO	JT8D	
08/14/87	645		2										NO	JT8D	
08/14/87	645		2										NO	JT8D	
08/15/87	433	FALCON*	2										NO	JT8D	
08/15/87	659	HAWK*	2										NO	JT8D	
08/17/87	130		2										NO	JT8D	
08/17/87	148		2										NO	JT8D	
08/18/87	625		2										NO	JT8D	
08/18/87	670		2										NO	JT8D	
08/19/87	131	GULL*	1										NO	JT8D	
08/19/87	1069	KILLDEER AND STARLING	1		5N33								NO	JT8D	
08/20/87	1069		1										NO	JT8D	
08/20/87	509		1										NO	JT8D	
08/22/87	324		1										NO	JT8D	
08/22/87	371		1										NO	JT8D	
08/22/87	372		1										NO	JT8D	
08/23/87	633		2										NO	JT8D	
08/23/87	650		2										NO	JT8D	
08/23/87	1070		2										NO	JT8D	
08/23/87	1071		2										NO	JT8D	
08/23/87	1071		2										NO	JT8D	
08/23/87	660	COMMON LAPWING	1		5N1								NO	JT8D	
08/25/87	210		2										NO	JT8D	
08/25/87	188		1										NO	JT8D	
08/26/87	174		1										NO	JT8D	
08/26/87	374		1										NO	JT8D	
08/26/87	451		1										NO	JT8D	
08/27/87	666		1										NO	JT8D	
08/27/87	689		1										NO	JT8D	
08/28/87	325		1										NO	JT8D	

DATA SOURCES: ENGINE MANUFACTURER OR ICAO

EDATE	EV#	ENG POS	DWG CODE	SEVERITY	POW LOSS	MAX VIBE	THROTTLE	IFSD	REMARKS
07/25/87	605	1		2	EPR DEC			NO	MEDIUM BIRD
07/26/87	123	1	A,B,G,H	2	COMPRESSOR	YES		YES	STRONG ODOOR IN CABIN
07/26/87	141	2		2	NONE			NO	METAL IN TAILPIPE
07/26/87	266	2		2					
07/26/87	612	2		2					
07/27/87	321	1	A,G,H	2					EPR SYMPTOM
07/27/87	435	1	A,H,Q	2					SMALL BIRD, SUBSTANTIAL DAMAGE
07/27/87	1065	1		2					
07/29/87	126	1		2					STRONG ODOOR IN CABIN
07/29/87	142	1	A,C	2					
07/29/87	368	2		2					
07/29/87	619	2	A,C,G,K	2					LARGE BIRD
07/30/87	127	1		1	EPR DEC		CUTOFF	EPR	FAN CHANGE, ENG SHUTDOWN ON TAXI, COMP DAM
07/30/87	322	2		2					
07/30/87	285	2		2					
07/30/87	635	2		2					MEDIUM BIRD
07/31/87	143	1		2					STRONG ODOOR IN CABIN
07/31/87	144	1	A,B,D,H	2			RETARD	NO	
07/31/87	624	1		2				NO	MEDIUM BIRD
08/01/87	600	2		2					SMALL BIRD
08/03/87	128	2		2	COMPRESSOR				#2 ENGINE STALLED AT 80 KTS, PM EVENT
08/03/87	150	2		2					
08/03/87	265	2		2					
08/03/87	367	2		2					
08/03/87	369	2		2					TIRE FAILURE
08/04/87	323	2	A,C	2					
08/04/87	323	2	A,H	2					
08/05/87	145	1	A,H	2		3.5		NO	EVENT OCCURRED IN PM
08/05/87	146	1	A,H	2		2.2		NO	
08/05/87	146	1		2				NO	
08/05/87	146	1		2				NO	
08/05/87	146	1		2				NO	
08/05/87	370	1		2					
08/05/87	643	1	A	2					MEDIUM BIRD
08/06/87	147	2		2					FOUND ON GRD INSPEC, 4 FAN BLADES REPLACED
08/06/87	626	2		2					MEDIUM BIRD
08/07/87	649	1	A,H	2					SMALL BIRD
08/07/87	1067	1		2					FOUND ON GRD INSPEC
08/07/87	1068	1		2					
08/08/87	1066	1	A	2	COMPRESSOR				UNK POWER LOSS, 6 F BLDG UNKNOWN DAMAGE
08/12/87	597	2	A,Q	2					MEDIUM BIRD
08/13/87	693	2		2					
08/14/87	208	2		2					
08/14/87	645	2		2					
08/15/87	645	2		2					SMALL BIRD
08/15/87	645	2	A,Q	2					
08/15/87	649	2	A,H	2					
08/15/87	649	2	A,C,H	2					
08/17/87	130	2		2				NO	
08/17/87	148	2		2		HIGH		NO	
08/18/87	625	2		2					
08/18/87	625	2		2					
08/19/87	611	1		1					MOMENTARY EGT INC OF 70 DEG.C, 2-4 BIRDS
08/19/87	1069	1		1					
08/20/87	309	1		1					
08/20/87	324	1		1					
08/22/87	371	1		1					
08/22/87	372	1		1					
08/23/87	633	2		2					
08/23/87	633	2		2					
08/23/87	650	2		2					MEDIUM BIRD
08/23/87	1070	2		2				NO	LARGE BIRD
08/23/87	1071	2		2				NO	
08/23/87	1071	2		2					
08/23/87	373	2		2					
08/23/87	600	2		2					
08/25/87	210	2		2					
08/26/87	188	1	A,C,G,I	1				NO	1, 1st STAGE F BLADES WERE FRAC, 2nd DAM
08/26/87	374	1		1					
08/26/87	451	1		1					PM EVENT, LOUD ENGINE NOISE
08/27/87	666	1		1					
08/27/87	669	1		1					
08/28/87	325	1		1					

EDATE	EVT#	ENG POS	MFG	NO	ETIME	SIGN	EVT	AIRCRAFT	POF	ALTITUDE	SPEED	FL RULES	LT CONDS	WEATHER	CREW AC	CREW AL	BIRD	SEE
08/28/87	607	1	87	20:00:00	NONE		BIRDS	200	TAKEOFF	0	130			RAIN			SEVERAL	
08/29/87	211	2	90	16:15:00	MULT		BIRDS	200	TAKEOFF	0				BELOW CLOUDS		NO	YES	
08/29/87	268	1	80		MULT		BIRDS	200	TAKEOFF	0				OVERCAST		NO	SEVERAL	
08/29/87	326	2	130		NONE			200	TAKEOFF	0	115			CLEAR	OTHER	NO	SEVERAL	
08/29/87	598	1	87	14:10:00	MULT		BIRDS	200	LANDING	0	80				ATO	NO	YES	
08/29/87	620	1	87	18:00:00	NONE			200	TAKEOFF	0								
08/30/87	1072	2	1675		NONE			200	UNKNOWN	0								
08/31/87	149	2	873018		NONE			300	LANDING	0								
08/31/87	150	1	873019		NONE			300	LANDING	0								
08/31/87	151	1	873020		NONE			300	UNKNOWN	0								
08/31/87	269	2	873020	8:06:00	NONE			200	TAKEOFF	0	120	VFR		CLEAR	ATO	NO	ONE	
08/31/87	669	1	87	15:23:00	NONE			200	TAKEOFF	0	100			CLEAR		NO	FLOCK	
09/01/87	327	1	87	22:15:00	NONE			200	TAKEOFF	0	100			CLEAR	NONE	NO	ONE	
09/01/87	603	1	87	11:05:00	NONE			200	TAKEOFF	0	140				NONE	NO	ONE	
09/01/87	604	1	87		NONE			200	LANDING	15	155			CLOUDY	NONE		ONE	
09/02/87	328	1	0	6:57:00	NONE			200	TAKEOFF	0	140			CLOUDY	NONE		ONE	
09/03/87	595	2	87	9:00:00	NONE			300	TAKEOFF	0	100			CLEAR	NONE		ONE	
09/04/87	672	1	87	19:55:00	MULT	ENG		200	TAKEOFF	0	100			CLEAR	NONE		FLOCK	
09/04/87	672	2	87	19:55:00	MULT	ENG		200	TAKEOFF	0	90			CLEAR	NONE	NO	FLOCK	
09/04/87	696	1	87		MULT	ENG-8IRDS		200	TAKEOFF	0	90			CLEAR	NONE	NO	SEVERAL	
09/04/87	696	2	87		MULT	ENG-8IRDS		200	TAKEOFF	0	100			CLEAR	NONE	NO	ONE	
09/05/87	618	1	87	10:39:00	NONE			200	LANDING	0		VFR						
09/05/87	132	2	49	10:15:00	NONE			200	UNKNOWN	0	80			OVERCAST RAIN	NONE	NO	SEVERAL	
09/06/87	152	1	873021	11:20:00	NONE			300	LANDING	35	130	VFR		CLEAR	NONE	NO	FLOCK	
09/07/87	599	2	130		NONE			200	UNKNOWN	0	140				ATB	NO		
09/08/87	329	1	0		NONE			200	TAKEOFF	0	100							
09/08/87	449	2	1676		NONE			200	UNKNOWN	0	110			BELOW CLOUDS	NONE	NO	YES	
09/08/87	1073	1	873022	6:25:00	NONE			200	TAKEOFF	0	+V1				ATB	NO	ONE	
09/09/87	153	2	0		NONE			200	LANDING	0	140	IFR		CLEAR	NONE	NO	SEVERAL	
09/10/87	153	1	873022	6:25:00	NONE			200	CLIMB	0	100	VFR		CLEAR	NONE	NO	FLOCK	
09/10/87	153	2	0		NONE			200	TAKEOFF	0	100				ATO	NO	SEVERAL	
09/12/87	212	2	90	17:40:00	NONE			200	UNKNOWN	0	110			CLOUDY	NONE	NO	SEVERAL	
09/12/87	270	1	80		NONE			200	TAKEOFF	0	+V1				ATO	NO	FLOCK	
09/13/87	154	1	873023		NONE			200	TAKEOFF	20	150				NONE	NO	ONE	
09/14/87	172	2	59		NONE			200	UNKNOWN	0	140				ATB	NO	SEVERAL	
09/15/87	155	1	873024	9:06:00	NONE			200	TAKEOFF	0	100			CLEAR	NONE	NO	FLOCK	
09/15/87	376	1	180		NONE			200	LANDING	0	150				ATO	NO	SEVERAL	
09/16/87	156	1	873025	13:33:00	NONE			200	CLIMB	20	150	VFR			ATB	NO	ONE	
09/16/87	377	1	160		NONE			200	UNKNOWN	0	60			CLEAR	NONE	NO	SEVERAL	
09/16/87	1074	1	167	7:55:00	MULT		BIRDS	200	TAKEOFF	0	140			CLEAR	ATO	NO	FLOCK	
09/17/87	157	1	873026		NONE			200	TAKEOFF	0	140			CLEAR	NONE	NO	SEVERAL	
09/17/87	271	1	1168	18:45:00	NONE			200	TAKEOFF	20	150				NONE	NO	FLOCK	
09/17/87	331	2	0		NONE			200	LANDING	20	150				ATB	NO	ONE	
09/18/87	158	1	873027	16:50:00	NONE			200	APPROACH	0	150				NONE	NO	SEVERAL	
09/18/87	167	2	140		NONE			200	TAKEOFF	0	60			CLEAR	ATO	NO	FLOCK	
09/18/87	379	1	1678	6:30:00	NONE			200	UNKNOWN	0	140			CLEAR	NONE	NO	SEVERAL	
09/20/87	1075	1	0		NONE			200	TAKEOFF	0	140			CLEAR	ATO	NO	FLOCK	
09/21/87	621	1	87	9:55:00	NONE			200	TAKEOFF	0	140			CLEAR	NONE	NO	SEVERAL	
09/21/87	673	2	87	13:40:00	NONE			200	TAKEOFF	0	140			CLEAR	NONE	NO	SEVERAL	
09/22/87	159	2	873028	0:43:00	NONE			200	TAKEOFF	0	140			CLEAR	NONE	NO	SEVERAL	
09/22/87	169	1	110	9:57:00	NONE			200	TAKEOFF	0	150			OVERCAST	ATO	NO	SEVERAL	
09/22/87	272	1	110		NONE			200	TAKEOFF	0	150			CLEAR	NONE	NO	SEVERAL	
09/22/87	668	1	1679	10:57:00	NONE			200	TAKEOFF	0	150			CLEAR	NONE	NO	SEVERAL	
09/22/87	1076	1	873029	19:20:00	NONE			200	UNKNOWN	80				CLEAR	NONE	NO	SEVERAL	
09/23/87	160	2	0		NONE			200	TAKEOFF	0	80			PARTLY CLOUD	ATO	NO	SEVERAL	
09/24/87	380	1	150		NONE			200	UNKNOWN	0					NONE	NO	SEVERAL	
09/24/87	1077	2	1680		NONE			200	UNKNOWN	0					NONE	NO	SEVERAL	
09/25/87	333	1	130		NONE			200	UNKNOWN	0					NONE	NO	SEVERAL	
09/27/87	334	1	130		NONE			200	UNKNOWN	0					NONE	NO	SEVERAL	
09/28/87	170	1	57	17:23:00	NONE			200	UNKNOWN	0					NONE	NO	SEVERAL	
09/29/87	173	1	60		NONE			200	TAKEOFF	0					NONE	NO	SEVERAL	
09/30/87	204	1	873030		NONE			200	LANDING	10	145			CLEAR	NONE	NO	SEVERAL	
10/01/87	189	1	874001	19:36:00	NONE			200	CRUISE	0				CLOUDY	ATB	NO	SEVERAL	
10/01/87	213	2	90	19:35:00	NONE			200	TAKEOFF	0								
10/01/87	613	1	87		NONE			200	CRUISE	0								

D. A SOURCES: ENGINE MANUFACTURER OR ICAO

EDATE	EVT#	ENG POS	BIRD NAM	BIRD SPE	# BIRDS	WT OZ	1	CTY	PRS	AIRPORT	LOCALE	US INCID	ENGINE	DASH
08/28/87	607	1	COMMON SNIPES	6M47						YXJ	FT. ST. JOHN, CANADA	NO	JT8D	
08/29/87	211	2	COMMON SNIPES	6M47						YXJ	FT. ST. JOHN, B.C., CANADA	NO	JT8D	
08/29/87	268	1	SWALLOW*		*	4.4		FRA-LNZ		FRA	FRANKFURT, GERMANY	NO	JT8D	15
08/29/87	326	2	SWALLOW*		*	3.		PHR-AKL		PHR	PALMERSTON, NEW ZEALAND	NO	UNK	
08/29/87	598	1	EURASIAN KESTREL	5K27						LNZ	LONZ, AUSTRIA	NO	UNK	
08/30/87	620	1			1	7.				LDE	LOJROES, FRANCE	NO	JT8D	17
08/31/87	1072	2			1					COK	COCHIN, INDIA	NO	JT8D	
08/31/87	149	2			1					-IAN XUS	HOUSTON, TEX	YES	CFM56	
08/31/87	151	2			1					-KHI KHI	KARACHI, PAKISTAN	NO	CFM56	
08/31/87	269	1			1					-PHK XUS	PHOENIX, ARIZ	YES	CFM56	
08/31/87	669	1	GULL*		1					DUS-ZRH	DUSSELDORF, GERMANY	NO	JT8D	15
09/01/87	327	1	PIGEON*		1					FNC	J.G. STRIJDOM, S. AFRICA	NO	JT8D	
09/01/87	603	1			1					EROS	FUNCHAL, PORTUGAL	NO	UNK	
09/01/87	604	1			1					LRSB	OOSTENDE, BELGIUM	NO	UNK	
09/02/87	328	1	COMMON GULL	14N13						KHH	BRUNEL, ATL. MALAYSIA	NO	JT8D	15
09/03/87	375	1			1					XFO	KAHSIUNG, TAIWAN	NO	JT8D	
09/04/87	593	2								MEL	ENGLAND	NO	JT8D	9A
09/04/87	672	2								IBZ	MELBOURNE, AUSTRALIA	NO	CFM56	3
09/04/87	672	2								IBZ	IBIZA, SPAIN	NO	JT8D	
09/04/87	696	2			*					YSM	IBIZA, SPAIN	NO	JT8D	
09/04/87	696	2			*					YSM	FT SMITH, CANADA	NO	JT8D	
09/05/87	618	1			1					NCE	FT SMITH, CANADA	NO	CFM56	
09/06/87	132	2	OSPREY	2K1						MCO	NICE, FRANCE	NO	JT8D	3
09/06/87	152	1	GULL*		1					-DUS XFO	ORLANDO, FL	YES	JT8D	7
09/06/87	599	2			1					LNZ	DUSSELDORF, GERMANY	NO	CFM56	3
09/07/87	329	1			1					PHR	LONZ, AUSTRIA	NO	CFM56	
09/08/87	449	2			1					ORF	PALMERSTON, NEW ZEALAND	NO	JT8D	15
09/08/87	1073	1			1					XFO	NORFOLK, VA	YES	JT8D	9A
09/09/87	330	2	EURASIAN KESTREL	5K27						CRY	INDIA	NO	JT8D	
09/10/87	133	1			1					XFO	PARIS-ORLY, FRANCE	NO	JT8D	3
09/10/87	434	2	BUZZARD OR FALCON*							FRA	MUNICH, GERMANY	NO	CFM56	3
09/12/87	212	2			1					XFO	FRANKFURT, GERMANY	NO	CFM56	
09/12/87	270	1			1					MUC	CALGARY, ALTA., CANADA	NO	JT8D	15
09/13/87	154	1			1					YUL	MUNICH, GERMANY	NO	CFM56	3
09/14/87	172	2			1					XFO	MONTREAL, QUE., CANADA	NO	JT8D	17A
09/15/87	152	2	SHARP-SHINNED HAWK	3K105						YUL	SOUTH AFRICA	NO	CFM56	3
09/15/87	376	1			1					BMH	MIDLAND/ODESSA, TEX	YES	JT8D	7
09/16/87	156	1	YELLOW-BILLED CUCKOO	2R51						AUS	BIRMINGHAM, ALA	YES	CFM56	3
09/16/87	377	1			1					XFO	AUSTIN, TEX	YES	CFM56	9A
09/17/87	1074	1	KITE*		*					PAT	PATNA, INDIA	NO	JT8D	17
09/17/87	157	1			1					ZRH	ZURICH, SWITZERLAND	NO	CFM56	3
09/17/87	271	1	DOVE*		1					FRA	BIRMINGHAM, ENGLAND	NO	CFM56	15
09/17/87	331	2	GULL*		1					BHX	PRUDHOE BAY, ALASKA	YES	JT8D	
09/18/87	158	1	MASKED PLOVER		1					SCH	CANBERRA, A.C.T. AUSTRALIA	NO	CFM56	3
09/18/87	379	2			1					CBR	JOHANNESBURG, SOUTH AFRICA	YES	JT8D	17A
09/18/87	1075	1			1					JNB	JOHANNESBURG, SOUTH AFRICA	YES	JT8D	15A
09/20/87	332	1			1					AGR	AGRA, INDIA	NO	JT8D	17
09/21/87	621	1			1					BRU	BRUSSELS, BELGIUM	NO	JT8D	
09/21/87	621	1			1					LDE	LOJROES, FRANCE	NO	UNK	
09/21/87	673	2	SWIFT*		1					IBZ	IBIZA, SPAIN	NO	JT8D	3
09/22/87	159	2			1					STL	ST. LOUIS, MO	YES	CFM56	9
09/22/87	169	1	DOVE*		1					XUS	CAPE TOWN, SOUTH AFRICA	NO	JT8D	
09/22/87	272	1	DOVE*		1					CHG	CORUMBA, BRAZIL	NO	JT8D	
09/22/87	668	1	DOVE*		1					FACT	D.F. MALAN, S. AFRICA	NO	JT8D	17
09/22/87	1076	2			1					XFO	INDIA	NO	CFM56	3
09/23/87	160	1			1					PAT	HOUSTON, TEX	YES	JT8D	
09/23/87	450	2	DOVE*		1					BUI	BALTIMORE, MD	YES	JT8D	
09/24/87	380	1			1					XFO	INDIA	NO	JT8D	9A
09/24/87	1077	2			1					XFO	JAPAN	NO	JT8D	
09/25/87	333	1			1					XFO	AUCKLAND, NEW ZEALAND	NO	JT8D	
09/27/87	334	1			1					XFO	CLEVELAND, O	YES	JT8D	7
09/28/87	170	1			1					CLE	DENVER, COL	YES	JT8D	
09/29/87	173	2			1					XUS	TOWNSVILLE, AUSTRALIA	NO	CFM56	3
09/30/87	204	1			1					TSV	TORONTO, ONT., CANADA	YES	CFM56	3
10/01/87	189	1			1					XUS	NPEARSON INTL., CANADA	NO	JT8D	
10/01/87	213	2			1					YFZ		NO	JT8D	
10/01/87	613	1			1							NO	JT8D	

DATA SOURCES: ENGINE MANUFACTURER OR ICAO

DATE	EVT#	ENG POS	DWG CODE	SEVERITY	POW LOSS	MAX VIBE THROTTLE	IFSD	REMARKS
08/28/87	807	1	A,Q	3				SMALL BIRD, MINOR DAMAGE
08/29/87	211	2	A,C	3		YES	NO	SYNPTOM - VIBRATION
08/29/87	268	1		3				
08/29/87	326	2		3				
08/29/87	598	1		3				
08/29/87	630	1		3				
08/30/87	1072	2	A,C	3		YES	NO	SMALL BIRD
08/31/87	149	2		3			NO	3 F BLOS BENT, DROP IN EPR
08/31/87	150	1	A	4			NO	FOUND DURING GROUND INSPECTION
08/31/87	151	2	A	4		<2	NO	3 FAN BLADES DAMAGED
08/31/87	269	1		3			NO	1 FAN BLADE DAMAGED
08/31/87	669	1		3			NO	MEDIUM BIRD
09/01/87	327	1		3				
09/01/87	403	1		3				
09/01/87	604	1	A,H	3				MEDIUM BIRD
09/02/87	328	1	A,C	3				SMALL BIRD
09/03/87	375	1		3				3 FAN BLADES SHINGLED
09/04/87	593	2		3				
09/04/87	672	2		3				MEDIUM BIRD
09/04/87	696	2		3				SMALL BIRD
09/04/87	698	2		3				SMALL BIRD
09/04/87	618	2		3				SMALL BIRD
09/05/87	132	2		3				SMALL BIRD
09/06/87	152	2	A,K	3			NO	SMALL BIRD
09/06/87	599	2		3			NO	LPC DAMAGED
09/07/87	329	2		3				FOUND DURING GROUND INSPECTION
09/08/87	429	2		3				LARGE BIRD
09/08/87	1073	2		3			NO	AM EVENT
09/08/87	330	2		3			NO	ODOR
09/10/87	153	2		3			NO	FOUND DURING GROUND INSPECTION
09/10/87	434	2		3				
09/12/87	212	2		3			NO	MEDIUM BIRD
09/13/87	154	2	A,H	3		2	NO	4 FAN MID ACOUSTICAL PANELS REPLACED
09/13/87	172	2	A,C,H	3			NO	
09/13/87	155	2	A,C	3			NO	
09/13/87	156	2		3			NO	
09/15/87	376	2		3			NO	
09/16/87	377	2	A,C	3			NO	
09/16/87	1074	2	A,G	3			NO	
09/17/87	157	2	A,C	3			NO	
09/17/87	231	2		3			NO	
09/17/87	331	2		3			NO	
09/18/87	158	2		3			NO	
09/18/87	167	2	A,G	3			NO	
09/18/87	379	2		3			NO	
09/20/87	1075	2		3			NO	
09/21/87	332	2		3			NO	
09/21/87	631	2		3			NO	
09/21/87	673	2		3			NO	
09/22/87	159	2	A,C	3			NO	MEDIUM BIRD
09/22/87	169	2	A,C,L	3			NO	SMALL BIRD
09/22/87	272	2		3			NO	FOUND DURING GRD INSPEC, ODOR IN CABIN
09/22/87	668	2	A,H	3			NO	IGV AND COML IMAGE, 1 FAN BLADE DAMAGED
09/22/87	1076	2	A,B	3			NO	SMALL BIRD
09/23/87	140	2		3			NO	1 F BLD SHINGLED
09/23/87	250	2		3			NO	FOUND DURING GROUND INSPECTION
09/23/87	380	2	A,G	3			NO	AM EVENT
09/24/87	1077	2	A,D	3			NO	7 F BLOS BENT
09/25/87	333	2	A,C	3			NO	
09/25/87	334	2		3			NO	
09/28/87	170	2		3			NO	FOUND DURING GROUND INSPECTION
09/29/87	171	2		3			NO	ODOR IN CABIN
09/30/87	269	2	A,B,H	3		2.5	NO	PILOT HEARD "LOUD ENGINE NOISE"
10/01/87	189	2		3			NO	
10/01/87	213	2		3			NO	
10/01/87	613	2		3			NO	

DATA SOURCES: ENGINE MANUFACTURER OR ICAO

DATE	EVT#	ENG POS	MFG NO	ETIME	SIGN	EVT	AIRCRAFT	POF	ALTITUDE	SPEED	FL RULES	LT COND	WEATHER	CREW AC	CREW AL	BIRD SEE
10/02/87	335	1	120		NONE		200	UNKNOWN								
10/04/87	87	1	87	8:55:00	NONE		200	TAKEOFF		10 140			CLEAR	NONE	NO	ONE
10/04/87	630	2	87	19:10:00	NONE		UNK	TAKEOFF		75			CLOUDY	NONE		
10/04/87	686	2	120		NONE		200	TAKEOFF		140 130						NO
10/05/87	336	1	180		NONE		200	LANDING		100						
10/05/87	381	1	874002		NONE		300	CLIMB								
10/06/87	190	2	120		NONE		200	TAKEOFF		0 110						
10/06/87	337	1	120		NONE		200	TAKEOFF								
10/06/87	338	1	87	11:43:00	NONE		200	LANDING		0			CLOUDY	NONE	NO	
10/07/87	654	1	190		FRAC		200	UNKNOWN								
10/08/87	382	2	1881		ENG		200	UNKNOWN								
10/08/87	1078	2	1681		MULT		200	UNKNOWN								
10/08/87	1078	2	1681		MULT		200	TAKEOFF		0 115				ATO		YES
10/10/87	383	2	160	10:30:00	NONE		200	TAKEOFF								
10/10/87	448	2	0		NONE		200	UNKNOWN								
10/11/87	384	1	170		NONE		200	TAKEOFF		250 170			CLEAR	NONE	NO	ONE
10/11/87	601	1	87	16:11:00	NONE		300	APPROACH		100 140				ATO	NO	
10/11/87	616	2	87		NONE		100	TAKEOFF		0						
10/11/87	683	2	87	9:30:00	NONE		200	PAKED		0						
10/11/87	1079	2	1079	8:08:00	NONE		200	TAKEOFF		0			CLEAR	NONE	NO	ONE
10/11/87	1080	2	1683		NONE		200	UNKNOWN					CLEAR	NONE		SEVERAL
10/13/87	1081	2	1684	12:00:00	NONE		200	TAKEOFF		0 60				ATO		ONE
10/14/87	191	2	874003		NONE		300	CRUISE								
10/14/87	214	2	90		NONE		200	UNKNOWN								
10/15/87	385	2	160		NONE		200	UNKNOWN								
10/15/87	385	2	160		NONE		200	UNKNOWN								
10/16/87	192	1	874004		NONE		300	APPROACH								
10/16/87	386	1	170		NONE		300	CRUISE		4000 190		DARK	BELOW CLOUDS	NONE		
10/19/87	193	1	874005	15:00:00	NONE		200	LANDING		0				NONE		
10/19/87	661	1	87	20:15:00	BIRDS		300	UNKNOWN						NONE		
10/20/87	387	1	160		NONE		200	UNKNOWN			VFR				NO	FLOCK
10/21/87	388	2	180		NONE		200	TAKEOFF		0						
10/23/87	194	2	874006		NONE		300	UNKNOWN								
10/24/87	194	2	70		NONE		200	UNKNOWN								
10/24/87	195	2	874007	14:36:00	NONE		200	UNKNOWN		0 100				ATO		
10/25/87	359	2	0		NONE		300	LANDING								
10/26/87	176	2	70		NONE		200	UNKNOWN								
10/26/87	182	2	70		NONE		200	UNKNOWN								
10/28/87	187	2	74		TRVS		200	UNKNOWN								
10/28/87	435	2	0		NONE		300	UNKNOWN								
10/29/87	389	1	170		NONE		200	CRUISE		4500 210		DARK				ONE
10/29/87	394	1	87	7:00:00	NONE		300	TAKEOFF		0 130			CLOUDY	NONE		ONE
10/29/87	1082	2	1685		NONE		200	TAKEOFF		0 140			CLEAR	NONE		ONE
10/30/87	273	1	110		NONE		200	TAKEOFF						ATO		
10/31/87	174	1	61	14:02:00	NONE		200	TAKEOFF		0 80		VFR			NO	FLOCK
10/31/87	675	2	87	18:13:00	ENG		200	LANDING		200 125		DAY	CLEAR	ATO		SEVERAL
11/02/87	196	2	874008	7:00:00	MULT		300	APPROACH		200 135		DAWN	LOW CLOUDS	NONE		
11/02/87	196	2	874009	7:00:00	MULT		300	APPROACH		200 135		DAWN	LOW CLOUDS	NONE		
11/03/87	340	2	130		NONE		200	TAKEOFF		0 115						
11/04/87	422	1	0		NONE		200	TAKEOFF		100				ATO		
11/05/87	390	2	1375	19:50:00	BIRDS		200	TAKEOFF		0 130		DARK	BELOW CLOUDS	NONE		FLOCK
11/05/87	728	2	215		MULT		200	CLIMB		5000 250						FLOCK
11/06/87	183	2	70		NONE		200	UNKNOWN								
11/06/87	187	2	70		NONE		200	UNKNOWN								
11/08/87	177	2	64	22:15:00	NONE		200	UNKNOWN								
11/08/87	652	2	87	20:10:00	NONE		200	LANDING		275		VFR		NONE	YES	ONE
11/08/87	1083	2	1686	8:10:00	NONE		200	UNKNOWN		120			CLEAR	NONE	NO	ONE
11/09/87	611	1	87	22:22:00	BIRDS		200	TAKEOFF		0 128			CLEAR	NONE	NO	
11/09/87	1084	2	1687		NONE		200	LANDING		250 130			CLEAR	NONE	YES	SEVERAL
11/10/87	185	2	70		NONE		200	UNKNOWN								
11/10/87	188	2	874010	14:45:00	NONE		300	TAKEOFF		0 90		VFR		ATO	NO	YES
11/10/87	452	2	0		NONE		200	LANDING		0						
11/11/87	341	2	130		NONE		200	UNKNOWN								
11/11/87	617	2	87		NONE		200	UNKNOWN								
11/12/87	175	2	62	13:50:00	BIRDS		200	TAKEOFF		0 75		VFR		OTHER	NO	SEVERAL
11/14/87	436	2	874011	12:40:00	NONE		300	TAKEOFF		0 150		VFR		ATO	DIV	
11/14/87	739	2	182	9:52:00	NONE		300	CLIMB								
11/15/87	200	2	874012		NONE		300	UNKNOWN								
11/15/87	274	2	40		NONE		200	CLIMB						NONE		

DATA SOURCES: ENGINE MANUFACTURER OR ICAO

EDATE	EVT#	ENG POS	BIRD_NAM	BIRD_SPE	# BIRDS	WT_OZ	1	CTY_PRS	AIRPORT	LOCALE	US_INCID	ENGINE	DASH
10/02/87	335	1						ISG-OKA	XFO	JAPAN	NO	JT8D	
10/04/87	630	1	LAPWING*						HKG	HONG KONG	NO	JT8D	
10/04/87	686	2						MMY-OKA	MMY	TEES-SIDE, ENGLAND	NO	UNK	
10/05/87	336	1						DCA-IAD	IAD	MIYAKO JIMA, JAPAN	NO	JT8D	
10/05/87	381	2						PSA-	PSA	WASHINGTON, DC-DULLES	YES	JT8D	
10/06/87	190	2						ISG-OKA	ISG	PISA, ITALY	NO	CFM56	3
10/06/87	337	1						MMY-OKA	XFO	ISHIGAKI, JAPAN	NO	JT8D	
10/06/87	338	1							EICK	JAPAN	NO	JT8D	
10/07/87	654	2	GULL*						XFO	CORK, IRELAND	NO	JT8D	
10/08/87	382	2							XFO	INDIA	NO	JT8D	9A
10/08/87	1078	1							XFO	INDIA	NO	JT8D	9A
10/08/87	1078	2	BUZZARD*						XFO	INDIA	NO	JT8D	15
10/08/87	383	2						STR-HAD	STR	STUTTGART, GERMANY	NO	JT8D	
10/10/87	448								BHM	BIRMINGHAM, ALA	YES	JT8D	
10/11/87	384	1	COMMON BUZZARD	3K180					FCO	ROME-DA VINCI, ITALY	NO	JT8D	15
10/11/87	616	1							LOW	WIEN-SCHNEFEL, AUSTRIA	NO	CFM56	3
10/11/87	615	1							LFBO	BLAGNAC, FRANCE	NO	JT8D	
10/11/87	683	2							GLA	GLASGOW, SCOTLAND	NO	JT8D	17
10/11/87	1079	2							GLA	INDIA	NO	JT8D	17A
10/11/87	1080	2							GLA	INDIA	NO	JT8D	17
10/13/87	1081	2	SPARROW*						GLA	INDIA	NO	JT8D	17
10/14/87	191	2							BDQ	VADODARA, INDIA	NO	CFM56	3
10/14/87	214	1							XFO	BELGRADE, YUGOSLAVIA	NO	JT8D	
10/15/87	385	2							XFO	MONTREAL, QUE., CANADA	NO	JT8D	15
10/16/87	192	1	COMMON GULL	14N13					XFO	MALESIYA	NO	JT8D	15
10/17/87	192	1							XFO	FARO, PORTUGAL	NO	CFM56	3
10/17/87	386	1							XFO	NEWCASTLE, ENGLAND	NO	JT8D	15
10/19/87	193	1							XFO	AMSTERDAM, NETHERLANDS	NO	CFM56	3
10/19/87	361	1	SPARROW*						XFO	AMSTERDAM, NETHERLANDS	YES	JT8D	9A
10/20/87	687	1							XFO	SAN FRANCISCO/OAKLAND, CA	YES	JT8D	3
10/21/87	388	2							XFO	BEIJING, CHINA	YES	CFM56	3
10/21/87	194	2							XFO	MIAMI, FL	YES	CFM56	3
10/24/87	195	1							XFO	AUSTIN, TEX	YES	JT8D	
10/24/87	195	1							XFO	GERMANY	NO	JT8D	17
10/25/87	339	2							XFO	GERMANY	NO	CFM56	3
10/26/87	176	2							XFO	GERMANY	NO	JT8D	15
10/28/87	182	2							XFO	GERMANY	NO	CFM56	3
10/28/87	187	2							XFO	GERMANY	NO	JT8D	9A
10/28/87	435	2	AUSTRALIAN BELL MAGPIE	2327					XFO	GERMANY	NO	JT8D	7
10/29/87	389	1							XFO	GERMANY	NO	CFM56	3
10/29/87	594	2	VULTURE*						XFO	GERMANY	NO	JT8D	15
10/29/87	1082	2							XFO	GERMANY	NO	CFM56	3
10/30/87	273	1							XFO	GERMANY	NO	JT8D	9A
10/31/87	174	1	GULL*						XFO	GERMANY	NO	JT8D	7
10/31/87	675	2	LITTLE OWL	2S100					XFO	GERMANY	NO	CFM56	3
10/31/87	196	2	BLACK HEADED GULL	14N36					XFO	GERMANY	NO	JT8D	15
10/31/87	196	2	BLACK HEADED GULL	14N36					XFO	GERMANY	NO	JT8D	15
11/02/87	196	2							XFO	GERMANY	NO	JT8D	15
11/03/87	340	2							XFO	GERMANY	NO	JT8D	15
11/03/87	340	2							XFO	GERMANY	NO	JT8D	15
11/04/87	222	1	GULL*						XFO	GERMANY	NO	JT8D	15
11/05/87	390	2							XFO	GERMANY	NO	JT8D	15
11/05/87	728	1							XFO	GERMANY	NO	JT8D	15
11/06/87	183	2							XFO	GERMANY	NO	JT8D	15
11/07/87	184	2							XFO	GERMANY	NO	JT8D	15
11/08/87	177	2	SNOW GOOSE	2J26					XFO	GERMANY	NO	JT8D	17A
11/08/87	652	1							XFO	GERMANY	NO	JT8D	17
11/08/87	1083	1	KITE*						XFO	GERMANY	NO	JT8D	17
11/09/87	611	2	GOOSE*						XFO	GERMANY	NO	JT8D	17
11/09/87	1084	2							XFO	GERMANY	NO	JT8D	17
11/10/87	185	2	GREAT EGRET	1152					XFO	GERMANY	NO	JT8D	17
11/10/87	198	2							XFO	GERMANY	NO	JT8D	17
11/10/87	452	2							XFO	GERMANY	NO	JT8D	17
11/11/87	341	1	COMMON SKYLARK	17272					XFO	GERMANY	NO	JT8D	17A
11/11/87	617	2							XFO	GERMANY	NO	JT8D	17A
11/12/87	175	1	PIGEON*						XFO	GERMANY	NO	JT8D	17A
11/12/87	199	2							XFO	GERMANY	NO	JT8D	17A
11/14/87	436	2							XFO	GERMANY	NO	JT8D	17A
11/14/87	729	2							XFO	GERMANY	NO	JT8D	17A
11/15/87	200	1							XFO	GERMANY	NO	JT8D	17A
11/15/87	274	2							XFO	GERMANY	NO	JT8D	17A

DATA SOURCES: ENGINE MANUFACTURER OR ICAO

EDATE	EVT#	ENG_POS	DMG_CODE	SEVERITY	POM_LOSS	MAX_VIBE	THROTTLE	IFSD	REMARKS
10/02/87	335	1		9					SMALL BIRD
10/04/87	630	1		9					MEDIUM BIRD
10/04/87	686	2		9					SMALL BIRD
10/05/87	336	1		9					
10/05/87	381	2	A,B,H	3	NONE			NO	
10/06/87	190	2		9					LARGE BIRD
10/06/87	337	1		9					FOUND ON GRD INSPEC
10/06/87	338	1		9					FOUND ON GRD INSPEC
10/07/87	654	1	A,I	9		HIGH		NO	ENG REMOVED FAN AND DOWNSTREAM DAMAGE
10/08/87	382	2		9				NO	FOUND DURING GROUND INSPECTION
10/08/87	1078	1		9					SMALL BIRD
10/08/87	1078	2		9					LARGE BIRD
10/10/87	303	2	A,D,G	3	NONE				
10/10/87	384	2	A,B	3					3 F BLDs MINOR LE DAMAGE
10/11/87	601	1		9					1 F BLD MINOR LE DAMAGE
10/11/87	616	1		9					TIP CORNER LE BENT ON 5 FAN BLADES
10/11/87	643	2		9					
10/11/87	643	2	A,B	3				NO	
10/11/87	1080	1		3				NO	NIGHT EVENT
10/13/87	1081	1		3				NO	3 FAN BLADES DAMAGED
10/14/87	191	2	A,B	3	NONE				
10/14/87	214	2		3				NO	FOUND DURING GROUND INSPECTION
10/15/87	385	1	A,C	3				NO	1 FAN BLADE BENT
10/16/87	192	1		9					
10/17/87	386	1		9					2, 1st STAGE F BLADES WERE FRAC, 2nd DAM
10/19/87	193	1	A,H	3					NIGHT EVENT
10/19/87	661	1	A,Q	3					MEDIUM BIRD
10/20/87	387	1	A,C	3					SMALL BIRD
10/21/87	388	1		3				YES	HPC+LPC DAMAGE, 1 COMP BLADE TRYS FRAC
10/23/87	194	2	A,B,H	3	NONE			NO	
10/24/87	195	2	A,C	3				NO	
10/24/87	195	2	A,C	3	NONE				
10/25/87	339	1		9	COMPRESSOR				
10/25/87	339	1		9					
10/26/87	176	1	A,C	3					
10/28/87	182	2	A,C	3					
10/28/87	187	2	A,I	3					
10/29/87	435	2		9					
10/29/87	504	1		9					
10/30/87	1082	2		9					
10/30/87	273	1	A,D,G,K	9	COMPRESSOR				
10/31/87	174	1		9				YES	
11/02/87	675	2	A,H	3	NONE			NO	
11/02/87	196	1		3	NONE			NO	
11/03/87	196	1	A,H	3				NO	
11/03/87	340	1		9					
11/04/87	340	1		9					
11/05/87	350	2	A,H	9					
11/05/87	728	2	A,C	3					
11/07/87	184	2	A,C	3					
11/08/87	177	2	A,D,H,N	3					
11/08/87	652	1		9					
11/08/87	1083	1	A,Q	9				NO	SMALL BIRD
11/09/87	611	1		9				YES	MINOR DAMAGE, LARGE BIRD
11/09/87	1084	1	A,B,C	3				NO	FOUND ON GRD INSPEC
11/10/87	185	2	A,D,G	3				NO	TIP PCE BRK (3.5X2.5IN), ACCU LINER TORN
11/10/87	198	2		9					
11/10/87	452	1		9					
11/11/87	331	1		9					
11/11/87	617	2	A,D	9					
11/12/87	175	1	A,H	3	COMPRESSOR		IDLE	NO	SMALL BIRD
11/14/87	199	2	A	3	NONE			NO	SURGES CONTINUES AT IDLE, HIGH EGT
11/14/87	436	2	A,E,K	4				NO	ODOR IN CABIN, EVIDENCE OF DEBRIS IN CORE
11/14/87	729	2	A,H	1		5.0		NO	IMPACT DAMAGE IN LOW + HIGH COMPRESSOR
11/15/87	200	1		3					FOUND DURING GROUND INSPECTION
11/15/87	274	2		9					

DATA SOURCES: ENGINE MANUFACTURER OR ICAO

EDATE	EVT#	ENG_POS	MFG_NO	ETIME	SIGN_EVT	AIRCRAFT	POF	ALTITUDE	SPEED	FL_RULES	LT_CONDS	WEATHER	CREW_AC	CREW_AL	BIRD_SEE
11/16/87	437		0	14:45:00	NONE	300	CRUISE								
11/18/87	391		170		NONE	200	UNKNOWN								
11/20/87	695	1	87	18:00:00	NONE	200	TAKEOFF		0 120		DARK	CLOUDY	NONE	NO	ONE
11/22/87	1085	1	1688	19:25:00	NONE	200	TAKEOFF		0 100			CLEAR	ATO	NO	YES
11/23/87	201	1	874013	17:00:00	NONE	300	TAKEOFF		+V1		DUSK		ATB		
11/23/87	215	1	90		NONE	200	UNKNOWN								
11/23/87	275	1	110		NONE	200	TAKEOFF								
11/23/87	421	1	0		ENG	300	TAKEOFF						ATB		
11/23/87	421	2	0		MULT	300	TAKEOFF						ATB		
11/24/87	392	2	1377	7:55:00	ENG	200	TAKEOFF						ATB		
11/24/87	646	2	87	14:30:00	NONE	200	CLIMB	1000 160				CLEAR	NONE	NO	SEVERAL
11/25/87	202	2	874014		NONE	200	TAKEOFF	10 138					ATB		SEVERAL
11/25/87	393	2	180	21:50:00	NONE	300	TAKEOFF	+V1					ATO		
11/26/87	342	2	0		NONE	200	TAKEOFF	0 135							
11/26/87	423	2	0		ENG-BIRDS	200	TAKEOFF								
11/26/87	423	1	0		MULT	200	TAKEOFF								
11/26/87	656	1	87	11:05:00	ENG-BIRDS	200	TAKEOFF		0 120		DAY	PARTLY CLOUD	NONE	NO	FLOCK
12/01/87	1087	2	1690	19:32:00	NONE	200	TAKEOFF		0 120		DAY	PARTLY CLOUD	NONE	NO	FLOCK
12/02/87	179	2	66	20:00:00	NONE	200	TAKEOFF		0 142			RAIN	ATO	NO	SEVERAL
12/02/87	343	2	120		NONE	200	TAKEOFF		0 90			CLEAR	ATO	NO	ONE
12/02/87	343	2	120		NONE	200	TAKEOFF								
12/02/87	639	2	87	16:37:00	NONE	200	TAKEOFF		0 130			CLEAR	NONE	NO	ONE
12/03/87	216	1	90	9:13:00	NONE	200	TAKEOFF		0				ATB		
12/04/87	344	2	0		NONE	200	TAKEOFF		0 123				NONE		
12/04/87	688	1	87	12:05:00	BIRDS	300	APPROACH								
12/06/87	217	2	84		MULT	200	TAKEOFF								
12/06/87	276	2	80		NONE	200	TAKEOFF								
12/08/87	277	2	110		NONE	200	TAKEOFF								
12/08/87	651	1	87		NONE	200	TAKEOFF						ATO	NO	FLOCK
12/11/87	180	1	87	7:20:00	BIRDS	200	UNKNOWN		0			CLEAR	NONE		
12/12/87	394	2	150		NONE	200	UNKNOWN		0 100		TWILIGHT				
12/13/87	731	2	240		NONE	200	UNKNOWN								
12/13/87	203	1	874015		NONE	300	LANDING								
12/15/87	678	1	87		NONE	200	TAKEOFF						NONE	NO	FLOCK
12/15/87	732	1	1235		NONE	200	TAKEOFF	210					ATB		
12/17/87	181	1	88	15:00:00	MULT	200	TAKEOFF								
12/20/87	278	1	89		NONE	200	TAKEOFF								
12/23/87	219	2	90		NONE	200	UNKNOWN		50 110		DAY	PARTLY CLOUD			
12/24/87	1086	2	1689		NONE	200	UNKNOWN						ATO	NO	ONE
12/27/87	641	2	87	8:22:00	NONE	200	TAKEOFF		0 70			CLOUDY	ATO	NO	ONE
12/28/87	670	1	87	16:35:00	NONE	200	LANDING		0 110			CLEAR	NONE	NO	
12/29/87	186	2	73		NONE	200	UNKNOWN								
01/03/88	733	1	260		NONE	200	UNKNOWN								
01/03/88	1088	1	1691	8:49:00	NONE	200	TAKEOFF		0 100				ATO	NO	SEVERAL
01/03/88	1234	1	88		NONE	100	APPROACH						NONE	NO	
01/04/88	535	1	1424		NONE	200	TAKEOFF								
01/04/88	1297	1	88		NONE	200	APPROACH								
01/05/88	1089	2	1692		NONE	200	TAKEOFF		1000 130			CLEAR	NONE	NO	SEVERAL
01/07/88	279	2	71	23:15:00	NONE	200	TAKEOFF		0 60				ATO	NO	NO
01/07/88	395	2	140		NONE	200	UNKNOWN								
01/11/88	283	2	881001		NONE	300	CLIMB						NONE		
01/14/88	734	2	220		NONE	200	UNKNOWN								
01/15/88	220	1	77		NONE	200	UNKNOWN		0 100			CLEAR	ATO	NO	ONE
01/17/88	1090	2	1693	10:58:00	NONE	200	TAKEOFF								
01/19/88	221	1	90		NONE	200	UNKNOWN						ATO	NO	ONE
01/19/88	1091	2	1694	18:40:00	NONE	200	TAKEOFF		0 140			CLEAR	ATO	NO	ONE
01/20/88	1092	2	1695	18:50:00	NONE	200	LANDING		200 125				NONE	NO	SEVERAL
01/20/88	1225	2	88	10:15:00	MULT	300	LANDING		200 130			RAIN	NONE	NO	SEVERAL
01/20/88	1225	2	88	10:15:00	MULT	300	LANDING		200 130				ATO		
01/21/88	735	1	220		NONE	200	TAKEOFF		0 140						
01/22/88	736	2	220		NONE	200	UNKNOWN								
01/25/88	222	2	881002		NONE	300	LANDING						NONE	NO	SEVERAL
01/25/88	284	2	881003		NONE	300	UNKNOWN						NONE	NO	SEVERAL
01/25/88	285	2	88		NONE	300	TAKEOFF		+V1				ATB	NO	SEVERAL
01/27/88	1252	2	88	9:57:00	NONE	200	TAKEOFF		0 150			CLOUDY	NONE	NO	FLOCK
01/27/88	1252	2	88		MULT	200	APPROACH		600 130			CLEAR	NONE	NO	YES
01/28/88	286	2	881004	12:05:00	NONE	300	UNKNOWN		0						
02/01/88	396	2	1312		NONE	200	LANDING								

DATA SOURCES: ENGINE MANUFACTURER OR ICAO

DATE	EVT#	ENG POS	BIRD NAM	BIRD SPE	# BIRDS	WT OZ	1	CTY	PRS	AIRPORT	LOCALE	US_INCID	ENGINE	DASH
11/16/87	437									HAM	HAMBURG, GERMANY	NO	CFM56	3
11/18/87	391									XFO	HAMBURG, GERMANY	NO	JT8D	15
11/20/87	695									FVCP	PRINCE CHARLES, ZIMBABWE	NO	JT8D	9A
11/22/87	1085									BOM	BOMBAY, INDIA	NO	CFM56	3
11/23/87	201									DAY	DAYTON, OH	YES	JT8D	3
11/23/87	215									XFO	OTTAWA, ONT. CANADA	NO	CFM56	3
11/23/87	275									SLZ	SÃO LUÍZ, BRAZIL	YES	JT8D	3
11/23/87	421									DAY	DAYTON, OH	YES	CFM56	3
11/23/87	421									DAY	DAYTON, OH	YES	CFM56	3
11/24/87	392									DUS	DUESSELDORF, GERMANY	NO	JT8D	15
11/24/87	442									STR	SRINAGAR, INDIA	NO	JT8D	3
11/25/87	502									XFO	KARACHI, PAKISTAN	NO	CFM56	17
11/25/87	593									SFO	SAN FRANCISCO/OAKLAND, CA	YES	JT8D	3
11/26/87	342									ISG	ISHIGAKI, JAPAN	NO	JT8D	9A
11/26/87	453									LTH	LIHUE, KAUAI, HAWAII	YES	JT8D	9A
11/26/87	453									LTH	LIHUE, KAUAI, HAWAII	YES	JT8D	9A
11/26/87	456									LIPE	BORGOMANICO, ITALY	NO	JT8D	9A
12/01/87	1087									BOM	BOMBAY, INDIA	NO	JT8D	9A
12/02/87	179									KOA	KONA, HAWAII	YES	JT8D	9A
12/02/87	343									XFO	JAPAN	NO	JT8D	9A
12/02/87	639									GAU	GAUHATI, INDIA	NO	JT8D	9A
12/03/87	216									YQB	QUEBEC, QUE. CANADA	NO	JT8D	9A
12/04/87	344									ISG	ISHIGAKI, JAPAN	NO	JT8D	9A
12/04/87	688									LHR	LONDON-HEATHROW, ENGLAND	NO	JT8D	9A
12/04/87	217									ACA	ACAPULCO, MEXICO	NO	JT8D	9A
12/06/87	276									XFO	ARACAJU, BRAZIL	NO	JT8D	9A
12/08/87	277									AJU	CHANDIGARH-DELHI, INDIA	NO	JT8D	9A
12/11/87	180									HAJ	HANOVER, GERMANY	NO	JT8D	9A
12/12/87	394									XFO	DUBLIN, IRELAND	NO	JT8D	9A
12/13/87	203									DUB	CARTHAGE, TUNISIA	NO	JT8D	9A
12/13/87	203									DTTA	PARIS-ORY, FRANCE	NO	JT8D	9A
12/13/87	978									ORY	LASHAM, ENGLAND	NO	JT8D	9A
12/15/87	732									XFO	CHALOTTE, NC	YES	JT8D	9A
12/17/87	181									CLT	CALGARY, ALTA. CANADA	NO	JT8D	9A
12/20/87	278									BOS	SRINAGAR, INDIA	NO	JT8D	9A
12/23/87	219									XFO	MADRAS, INDIA	NO	JT8D	9A
12/24/87	1086									SRX	JAN SMUTS, S. AFRICA	NO	JT8D	9A
12/27/87	641									MAA	LAGOS, NIGERIA	NO	JT8D	9A
12/28/87	670									JNB	TAIWAN	NO	JT8D	9A
12/29/87	186									LOS	COIMBATORE, INDIA	NO	JT8D	9A
01/03/88	733									CJB	NICE, FRANCE	NO	JT8D	9A
01/03/88	1088									NCE	MAR DEL PLATA, ARGENTINA	NO	JT8D	9A
01/03/88	1234									MDQ	SAMOS, GREECE	NO	JT8D	9A
01/04/88	535									SMI	COCHIN, INDIA	NO	JT8D	9A
01/04/88	1307									COK	DURBAN, S. AFRICA	NO	JT8D	9A
01/05/88	1089									DUR	KINGSTON, JAMAICA	NO	JT8D	9A
01/07/88	279									XFO	MELBOURNE, AUSTRALIA	NO	JT8D	9A
01/07/88	595									MEL	MAR DEL PLATA, ARGENTINA	NO	JT8D	9A
01/11/88	283									XFO	TRIVANDRUM, INDIA	NO	JT8D	9A
01/14/88	734									XFO	BANGALORE, INDIA	NO	JT8D	9A
01/15/88	220									BLR	CALGARY, ALTA. CANADA	NO	JT8D	9A
01/17/88	1090									XFO	HYDERABAD, INDIA	NO	JT8D	9A
01/19/88	221									HYD	INDIA	NO	JT8D	9A
01/19/88	1091									XFO	CAIRNS, AUSTRALIA	NO	JT8D	9A
01/20/88	1092									CNS	CAIRNS, AUSTRALIA	NO	JT8D	9A
01/20/88	1225									CNS	SALTA, ARGENTINA	NO	JT8D	9A
01/21/88	735									SLA	BUENOS AIRES, ARGENTINA	NO	JT8D	9A
01/22/88	736									XFO	CASABLANCA, MOROCCO	NO	JT8D	9A
01/23/88	222									AEP	AMSTERDAM, NETHERLANDS	NO	JT8D	9A
01/23/88	284									CAS	GOVERNORS HARBOR, BAHAMAS	NO	JT8D	9A
01/25/88	285									XFO	LUTON, ENGLAND	NO	JT8D	9A
01/27/88	1272									GHB	SACRAMENTO, CA	YES	JT8D	9A
01/27/88	1292									LTH	LIHUE, KAUAI, HAWAII	YES	JT8D	9A
01/28/88	223									SMF	ONTARIO, CA	YES	JT8D	9A
01/30/88	286									XUS	GOTHENBURG, SWEDEN	NO	JT8D	9A
02/01/88	596									GOT		NO	JT8D	9A

DATA SOURCES: ENGINE MANUFACTURER OR ICAO

EDATE	EVT#	ENG_POS	DMG_CODE	SEVERITY	POM_LOSS	MAX_VIBE	THROTTLE	IFSD	REMARKS
11/16/87	437		A	4					NIGHT EVENT SMALL BIRD
11/18/87	391			0					
11/20/87	695			0					
11/22/87	1085			3	NONE	INC.		NO	
11/23/87	201		A,B A,C	3				NO	
11/23/87	215			2					CABIN ODOR REPLACED FOUR PAIRS OF FAN BLADES
11/23/87	421		A,D	0					
11/23/87	421			0	NONE			NO	
11/24/87	392			0					SMALL BIRD 3 STAGE 1 BOOSTER VANES SHEARED OFF
11/24/87	549		A	4	NONE	4.5		NO	
11/25/87	502			3				NO	
11/26/87	393		A,C	0					PM EVENT MEDIUM BIRD, MINOR DAMAGE BLD PIECES THRU CORE OIL PRESS DROPPING FOUND ON GROUND INSPEC DUE TO ENG ODOR
11/26/87	453		A,Q A,G,K A,C	4		HIGH		VIBES NO	
11/26/87	657			1					
12/01/87	1087			3	NONE				SMALL BIRD
12/02/87	343			0					
12/02/87	639		A,C	0					
12/03/87	216			3					
12/04/87	344			0					
12/04/87	688		A,D A,C	2	COMPRESSOR			NO	EPR SYMPTOM, CABIN ODOR, SMALL BIRDS
12/06/87	217			0					
12/06/87	276			3					
12/08/87	277			1		HIGH			SUBSTANTIAL FAN BLADE DAMAGE
12/08/87	651		A,Q A,D,H A,C A,G	4	NONE			NO	
12/11/87	180			2					ENGINE REMOVED
12/12/87	394			0					6 FAN BLADES DAMAGED, ENGINE REMOVED
12/13/87	711			2	NONE	NONE		NO	
12/13/87	203			0					ENGINE REMOVED
12/13/87	678		A,Q A,G A,C A,G	4	COMPRESSOR COMPRESSOR	HIGH		VIBES	
12/15/87	732			1					
12/17/87	181			1					
12/20/87	278			2					
12/23/87	219			0				NO	MEDIUM BIRD LARGE BIRD
12/24/87	1086			0					
12/27/87	641			0					
12/28/87	670			0					
12/29/87	186		A,C A,D A,K	2				NO	4 FAN BLADES BLEND ON WING FAN CHANGED, COMP BLD BENT
01/03/88	733			1					DECREASE OF .05 IN EPR AND A DROP IN RPM
01/03/88	1088			0					
01/03/88	1234			0					
01/04/88	535			1				NO	
01/04/88	1297			0					
01/05/88	1089			0					
01/07/88	379		A,G	2				NO	ENGINE REMOVED
01/11/88	395			0					
01/11/88	283		A,C A,C	3	NONE			NO	
01/14/88	734			0					
01/15/88	220			0				NO	
01/17/88	1090			0				NO	
01/19/88	221			0					
01/19/88	1091			0				NO	
01/20/88	1092			0				NO	
01/20/88	1235			0				NO	
01/20/88	1235			0					
01/21/88	735			0	NONE			NO	
01/21/88	735			0					
01/22/88	222		A,C	0					2 FAN BLADE SETS REPLACED FOUND DURING GROUND INSPECTION
01/23/88	284		A,C,H A,G	3	NONE	3.0		NO	3 MATCHED PAIRS OF FAN BLADES REPLACED 4 F BLD'S UNK DAMAGE
01/25/88	285			0				NO	
01/27/88	1272			1					INGESTION CAUSED ENGINE "HUMM" FOUND DURING GROUND INSPECTION
01/27/88	1272			0					
01/28/88	223			3	NONE			NO	
01/30/88	286		A,C	0					
02/01/88	396			0					

DATA SOURCES: ENGINE MANUFACTURER OR ICAO

DATE	EVT#	ENG POS	MFG NO	ETIME	SIGN EVT	AIRCRAFT	POF	ALTITUDE	SPEED	FL RULES	LT CONDS	WEATHER	CREW AC	CREW AL	BIRD SEE
02/04/88	1264	1	88	19:40:00	NONE	300	LANDING					OVERCAST	NONE		
02/05/88	1233	2	260	7:18:00	NONE	200	UNKNOWN					OVERCAST	NONE	NO	ONE FLOCK
02/06/88	287	1	881005	16:35:00	MULT BIRDS	300	CLIMB		0 125	VFR	DUSK	OVERCAST	NONE		
02/06/88	738	1	260		NONE	200	UNKNOWN		500 160			CLEAR	NONE		
02/06/88	739	1	260		NONE	200	UNKNOWN		0				NONE		SEVERAL
02/07/88	289	2	881007	8:30:00	NONE	300	LANDING						NONE		
02/08/88	290	1	881008		NONE	300	CRUISE						NONE		
02/08/88	740	2	260		NONE	200	UNKNOWN						NONE		
02/09/88	288	1	881006		NONE	300	UNKNOWN						NONE		
02/10/88	291	2	881009	22:00:00	INV POW LOSS	300	TAKEOFF		100 128		DARK	RAIN	NONE	NO	NO
02/11/88	292	1	881010		NONE	300	UNKNOWN						NONE		
02/11/88	397	1	1306	18:15:00	NONE	200	LANDING		250 145	VFR			DIV		YES
02/15/88	398	2	1331	12:20:00	NONE	200	UNKNOWN						NONE	NO	SEVERAL
02/15/88	1093	1	1696		NONE	200	APPROACH		4000 210			CLOUDY	NONE	NO	
02/15/88	1223	1	88		NONE	100	TAKEOFF		0				NONE	NO	
02/16/88	1094	1	1697	12:30:00	NONE	200	TAKEOFF		0 146			CLEAR	NONE	NO	
02/18/88	399	1	1311		NONE	200	UNKNOWN		0 80			OVERCAST	NONE	NO	SEVERAL
02/18/88	1095	2	1698	6:55:00	NONE	200	LANDING						NONE	NO	
02/19/88	281	2	76		NONE	200	UNKNOWN						NONE	YES	ONE
02/19/88	293	1	881011	7:10:00	NONE	300	TAKEOFF		0 60	VFR		CLEAR	NONE	NO	
02/20/88	741	1	220		NONE	200	TAXI		0 10			FOG	ATO	NO	ONE
02/21/88	1096	1	1699	5:55:00	NONE	200	TAKEOFF		0 125			CLOUDY	NONE		
02/24/88	294	1	881012	14:40:00	NONE	300	LANDING						NONE		
02/24/88	742	1	220		NONE	200	UNKNOWN						NONE		
02/26/88	400	1	1309		NONE	200	CRUISE		200 140				NONE		
02/27/88	295	1	881013		NONE	200	LANDING						NONE		ONE
02/28/88	743	2	160		NONE	200	UNKNOWN		0 65				NONE	NO	
03/02/88	1097	1	1700	14:45:00	NONE	200	LANDING		100 130				NONE	NO	ONE
03/07/88	1304	1	88		NONE	200	APPROACH						NONE	NO	ONE
03/10/88	744	1	196	17:30:00	NONE	200	TAKEOFF		0 100			OVERCAST	NONE	NO	
03/11/88	282	2	81		NONE	200	TAKEOFF						NONE		SEVERAL
03/13/88	296	2	881014	10:35:00	NONE	200	LANDING		0 110			CLEAR	NONE		
03/14/88	1228	2	88		NONE	200	TAKEOFF						NONE		
03/14/88	297	2	881015		NONE	300	UNKNOWN						NONE		
03/18/88	745	2	220		NONE	200	APPROACH		500 160			CLEAR	OTHER		ONE
03/18/88	1284	1	88	11:05:00	NONE	300	LANDING		100				NONE	NO	ONE
03/20/88	298	1	881016	11:10:00	NONE	200	APPROACH		1150 120			OVERCAST	NONE	NO	ONE
03/21/88	746	1	198	10:40:00	NONE	200	TAKEOFF		140				NONE	NO	ONE
03/22/88	1098	2	1701	19:37:00	NONE	200	LANDING		0 130				NONE	NO	ONE
03/22/88	1270	1	88	17:55:00	MULT ENG-BIRDS	200	TAKEOFF		50 145			CLEAR	NONE	NO	
03/22/88	1270	2	88	17:55:00	MULT ENG-BIRDS	200	TAKEOFF		50 145			CLEAR	NONE	NO	
03/22/88	299	2	881017	18:40:00	NONE	300	CLIMB		300		OVERCAST	CLOUDY	ATB		
03/25/88	403	1	1308		NONE	200	UNKNOWN						NONE		
03/29/88	1249	1	88	11:30:00	MULT ENG-BIRDS	200	CLIMB		700 170			CLEAR	OTHER		FLOCK
03/29/88	1249	2	88	11:30:00	MULT ENG-BIRDS	200	CLIMB		700 170			CLEAR	OTHER		FLOCK
03/30/88	1259	1	88	20:02:00	MULT BIRDS	200	TAKEOFF		0 130			CLEAR	NONE	NO	FLOCK
03/30/88	1099	2	1702	8:53:00	NONE	200	LANDING		0 110			CLOUDY	NONE	NO	
04/01/88	404	2	96		NONE	200	TAKEOFF						NONE		
04/02/88	346	2	82		NONE	200	TAKEOFF						NONE		
04/02/88	405	1	102	3:10:00	NONE	200	TAKEOFF		90	VFR	NIGHT	PARTLY CLOUD	NONE	NO	
04/03/88	462	1	882001		NONE	200	UNKNOWN						ATO		
04/03/88	747	1	220		NONE	300	TAKEOFF		0				ATB		
04/04/88	461	2	882002	6:10:00	NONE	200	TAKEOFF		50 145		DAWN	CLEAR	NONE		
04/06/88	406	1	140		NONE	200	UNKNOWN						NONE		
04/06/88	407	2	180		NONE	200	LANDING						NONE		
04/07/88	748	1	166		NONE	200	TAKEOFF						NONE		
04/08/88	408	1	95		NONE	200	UNKNOWN						ATO		
04/09/88	463	1	882003	6:10:00	NONE	300	UNKNOWN						NONE		
04/09/88	464	2	882004		NONE	200	UNKNOWN						NONE		
04/10/88	489	2	200		NONE	200	UNKNOWN						NONE		
04/12/88	347	2	83		NONE	200	TAKEOFF		350 170	VFR	NIGHT	CLEAR	NONE	NO	NO
04/13/88	409	2	1307		NONE	200	UNKNOWN								
04/13/88	411	2	1826		NONE	200	TAKEOFF		+V1						
04/13/88	465	1	882005		NONE	300	TAKEOFF								

DATA SOURCES: ENGINE MANUFACTURER OR ICAO

EDATE	EVT#	ENG_POS	BIRD_NAM	BIRD_SPE	#_BIRDS	WT_OZ_1	CTY_PRS	AIRPORT	LOCALE	US_INCID	ENGINE	DASH
02/04/88	1264	1	GULL*					SYD	SYDNEY, AUSTRALIA	NO	CFM56	3
02/05/88	1737	1						XFO	TAIWAN	NO	JT8D	7A
02/05/88	1253	2		*			ALC-MAN	HAI	HANOVER, GERMANY	NO	CFM56	3
02/06/88	287	1						XFO	ALICANTE, SPAIN	NO	JT8D	9A
02/06/88	738	1						XFO	TAIWAN	NO	JT8D	7A
02/06/88	739	1						XFO	LAHORE, PAKISTAN	NO	CFM56	3
02/07/88	289	2	KITE*					LHE	CA	YES	CFM56	3
02/08/88	290	1	LONG BILLED CURLEW		6N12		27. SJC-SAN	XUS	TAIWAN	NO	CFM56	7A
02/08/88	740	2						XFO	PHOENIX, ARIZONA	YES	CFM56	3
02/09/88	288	1						XUS	RIO DE JANEIRO, BRAZIL	NO	CFM56	3
02/10/88	291	2	BARN OWL		1S2		12.	GIG	DUNEDIN, NEW ZEALAND	NO	CFM56	3
02/11/88	292	1							SARASOTA/BRADENTON, FL	YES	JT8D	7
02/11/88	397	1						DUD	ENGLAND	NO	JT8D	7
02/15/88	280	1						SRQ-TPA	BHOPAL, INDIA	NO	JT8D	9A
02/15/88	398	2						XFO	BRUSSELS, BELGIUM	NO	JT8D	9A
02/15/88	1093	2	BARN OWL		1S2		11.25	GWL-BHO	RANCHI, INDIA	NO	JT8D	9A
02/15/88	1223	1						BRU	HYDERABAD, INDIA	NO	JT8D	17
02/16/88	1094	1						IXR-PAT	SAN FRANCISCO/OAKLAND, CA	YES	JT8D	7
02/18/88	399	1	KITE*					XFO	DALLAS/FT. WORTH, TEXAS-LOVE	YES	CFM56	3
02/18/88	1095	2						HTD	DELHI, INDIA	NO	CFM56	3
02/19/88	281	2	SPARROW*					SFO-LAX	BRISBANE, AUSTRALIA	NO	JT8D	9
02/19/88	293	1	PODAGER MACUNDA*					DAL-HOU	CHRISTCHURCH, NEW ZEALAND	NO	CFM56	3
02/20/88	741	1						TUC	GRANCANARIA, CANARY ISLANDS	NO	JT8D	9A
02/21/88	1096	1	HAWK*					DEL	BUENOS AIRES, ARGENTINA	NO	JT8D	17A
02/24/88	294	1						BNE	VARANASI, INDIA	YES	JT8D	17
02/24/88	742	1						XFO	NEW YORK, NY-NEWARK	YES	JT8D	17
02/26/88	400	1						XFO	TABATINGA, BRASIL	NO	JT8D	15
02/27/88	743	2	GULL*					VNS	STUTTGART, GERMANY	NO	JT8D	15
02/27/88	743	2	MILVAGO CHIMANGO*					XFO	HILO, HAWAII	YES	CFM56	3
03/02/88	1097	1						STR-HAJ	NEW YORK-LA GUARDIA	YES	CFM56	3
03/07/88	1304	1						ITO-HNL	CARRASCO, URUGUAY	NO	CFM56	3
03/10/88	745	1	AMERICAN BLACK VULTURE		1K4			MVD	SALEM, NC	YES	CFM56	3
03/11/88	282	2						GSO	CATANARCA, ARGENTINA	YES	JT8D	9
03/13/88	296	2						ISA	MT. ISA, AUSTRALIA	NO	CFM56	3
03/13/88	1228	2						GVA	MOUNT ISA, AUSTRALIA	NO	CFM56	3
03/14/88	297	2						BLR	GENEVA, SWITZERLAND	NO	CFM56	3
03/18/88	745	1						DUR	BANGALORE, INDIA	NO	JT8D	15
03/20/88	298	1						FRA-GVA	DURBAN, S. AFRICA	NO	JT8D	9A
03/21/88	746	1							NEW ORLEANS, LOUISIANA	YES	CFM56	3
03/22/88	1098	2	SHALLOW*					CHC	CHRISTCHURCH, NEW ZEALAND	YES	JT8D	17
03/22/88	1270	1	SHALLOW*					CHC	HABIB BOURGIBA, TUNISIA	NO	JT8D	17
03/24/88	299	2						MSY	HABIB BOURGIBA, TUNISIA	NO	JT8D	17
03/25/88	403	1						CHC	JOHANNESBURG, S. AFRICA	NO	JT8D	17
03/29/88	1249	2						CHC	MADRAS, INDIA	NO	JT8D	17
03/30/88	1099	2						CHC	HILO, HAWAII	YES	JT8D	9A
04/01/88	404	1						CHC	CALGARY, ALTA. CANADA	YES	JT8D	9A
04/02/88	346	2						CHC	LYTHE, KAUAI, HAWAII	YES	JT8D	9A
04/03/88	405	1						CHC	VANCOUVER, CANADA	NO	CFM56	3
04/03/88	747	1						CHC	TUCUMAN, ARGENTINA	NO	JT8D	17
04/03/88	747	1						CHC	SACRAMENTO, CA	YES	CFM56	3
04/04/88	461	2	BLACKCROWNED NIGHT HERON		1124			CHC	KINGSTON, JAMAICA	NO	CFM56	3
04/06/88	406	2						CHC	OKLAHOMA CITY, OKLA	YES	JT8D	15
04/06/88	407	2						CHC	MAURU, REP OF NAURU	NO	JT8D	17
04/07/88	748	1						CHC	NIGERIA	NO	CFM56	3
04/08/88	408	1						CHC	GREECE-YUGOSLAVIA	NO	CFM56	3
04/09/88	463	1						CHC	BEIJING, CHINA	NO	CFM56	3
04/09/88	464	2						CHC	KAGOSHIMA, JAPAN	YES	JT8D	9A
04/10/88	469	2						CHC	KAHULUI, MAUI, HAWAII	YES	JT8D	9A
04/12/88	347	2						CHC	CHRISTCHURCH, NEW ZEALAND	NO	JT8D	9A
04/12/88	409	2						CHC	FORMOSA, ARGENTINA	NO	JT8D	9A
04/13/88	411	1						CHC	HAMBURG, GERMANY	NO	CFM56	3
04/13/88	465	1						CHC				

DATA SOURCES: ENGINE MANUFACTURER OR ICAO

EDATE	EVT#	ENG POS	DMG CODE	SEVERITY	POW LOSS	MAX VIBE	THROTTLE	IFSD	REMARKS
02/04/88	1264	1	A,D	2					4 FAN BLADES CHANGED
02/05/88	737	1	A,C,H	2					3 MATCHED PAIRS OF FAN BLADES REPLACED
02/06/88	1253	2	A,D	3					7 BLADES BLENDING ON WING
02/06/88	738	1	A,D	3					9 FAN BLADES CHANGED
02/06/88	739	1		2					FLUCTUATING VIBRATION INDICATION
02/07/88	280	2	A,L	2	NONE	SOME			
02/08/88	590	1	A,D	2	NONE				4 FAN BLADES BLENDING ON WING
02/08/88	740	2		2					
02/09/88	288	1	A,I,M,P	2	NONE	HIGH			HEAVYDAMAGED ACOUSTIC PANELS,LOW OILPRES
02/10/88	291	2		1	YES				INVOLUNTARY
02/11/88	292	1		1	NONE				FOUND DURING GROUND INSPECTION
02/11/88	397	1		2					LARGE BIRD
02/15/88	280	1		2	COMPRESSOR				
02/15/88	398	2	A,C	3					
02/15/88	1093	2	A	3					
02/15/88	1223	1		2					3 F BLS UNK DAMAGE
02/16/88	1094	1		1					ODOR
02/18/88	399	1		2					LPC+HPC DAMAGE, FOUND ON GROUND INSPC.
02/18/88	1095	2	A,C,K	2					ODOR IN COCKPIT
02/19/88	281	1		1	NONE				
02/19/88	293	1		1	COMPRESSOR				
02/20/88	741	1		1	NONE				
02/21/88	1096	1		1	COMPRESSOR				
02/24/88	294	1		1	NONE				
02/24/88	742	1	A,H	3		SOME			
02/26/88	400	1		1					AM EVENT
02/27/88	295	1	A,B,E,H	2		5			
02/27/88	743	2	A,H	2					
02/28/88	401	1		1					
03/02/88	1097	1		1					
03/07/88	1304	1		1					
03/10/88	744	1		1					SMELL
03/11/88	282	2	A,L	3					
03/13/88	296	2		2	NONE				
03/13/88	1228	2		2	NONE				FOUND DURING GROUND INSPECTION
03/14/88	297	2		2					
03/18/88	745	2		2					
03/18/88	1284	1		1					
03/20/88	298	1		1	NONE				8 F BLS DAMAGED
03/21/88	746	2	A,G	2					
03/22/88	1098	2		2					
03/22/88	1270	2		2					
03/22/88	1270	2		2					
03/24/88	299	2	A,D	2			CUTOFF	YES	IFSD+POW LOSS NOT DUE TO BIRD INGESTION
03/25/88	403	1		1					
03/29/88	1249	1		1					
03/29/88	1259	1		1					
03/30/88	1099	2	A,C	2					
04/01/88	404	2		2	COMPRESSOR				
04/02/88	346	2		2					ODOR
04/02/88	405	1	A,D	2					6 SETS OF FAN BLADES CHANGED
04/03/88	462	1		1					
04/03/88	747	1	A,D,G,K	2		HIGH	RETARD		TIP PIECE BROKEN (5X2.5IN), COML PUNCS
04/04/88	461	2	A,G	2	NONE				
04/06/88	406	2		2					
04/06/88	407	2		2					
04/07/88	748	1	A,D,G,K	1					HEAVY DAMAGE, HPC DAMAGE
04/08/88	408	1	A,H	1					FOUND DURING GROUND INSPECTION
04/09/88	463	1		1	NONE				FOUND DURING GROUND INSPECTION
04/09/88	464	1		1	NONE				ODOR, MEDIUM BIRD
04/10/88	489	1		1					ODOR AND NOISE, ENG CHANGED
04/12/88	347	2		2					
04/12/88	409	1		1					
04/13/88	411	1	A	1					
04/13/88	465	1		1	NONE				

DATA SOURCES: ENGINE MANUFACTURER OR ICAO

EDATE	EVT#	ENG POS	MFG NO	ETIME	SIGN	EVT	AIRCRAFT	POF	ALTITUDE	SPEED	FL RULES	LT CONDS	WEATHER	CREW AC	CREW AL	BIRD SEE
04/16/88	410	2	1305		NONE		200	UNKNOWN		0 150			CLOUDY	NONE		ONE
04/16/88	1215	1	88	14:30:00	NONE		200	TAXI		0 10			CLOUDY	NONE		SEVERAL
04/16/88	1265	88	88	18:30:00	NONE		300	TAKEOFF		0 128			CLEAR	NONE	NO	SEVERAL
04/18/88	1247	2	882006	4:40:00	NONE		300	TAKEOFF		+V1	BRIGHT		CLEAR	ATO		SEVERAL
04/19/88	466	1	88	15:20:00	MULT BIRDS		300	LANDING		75 135			CLOUDY	NONE		
04/20/88	1289	2	88		NONE		200	UNKNOWN								
04/21/88	490	2	200		NONE		200	LANDING		7000 180						
04/22/88	749	2	220		NONE		200	CLIMB		0						
04/24/88	348	2	1293		NONE		200	TAXI								
04/25/88	412	1	180		NONE		200	UNKNOWN		0 125						
04/26/88	349	1	1257		NONE		200	CLIMB		0 119			CLEAR	NONE		
04/26/88	413	2	180	6:50:00	NONE		100	TAKEOFF						ATB		
04/27/88	1246	1	88		NONE		200	TAKEOFF		+V1				NONE		
04/27/88	351	1	1294		NONE		200	TAKEOFF								
04/27/88	351	1	1295		NONE		200	TAKEOFF								
04/27/88	351	1	882007		NONE		300	UNKNOWN								
04/28/88	352	1	91	23:10:00	MULT BIRDS		200	APPROACH		1000 142			CLOUDY	NONE	NO	SEVERAL
04/28/88	1319	1	88		NONE		200	LANDING						NONE	NO	ONE
04/29/88	414	1	180	22:38:00	NONE		200	LANDING		30 126			CLEAR	NONE	NO	ONE
04/29/88	1100	1	1703	7:54:00	NONE		200	LANDING		50 130			CLEAR	NONE	NO	ONE
04/29/88	1303	1	88	21:28:00	NONE		200	LANDING		20 135			CLEAR	OTHER	NO	ONE
04/30/88	1293	1	88		NONE		200	TAKEOFF								
05/01/88	353	2	92	19:22:00	MULT BIRDS		200	LANDING		0 90			CLOUDY	DIV	NO	SEVERAL
05/01/88	353	2	230	20:00:00	TRVS		200	TAKEOFF		0 115						
05/02/88	354	2	86	14:30:00	NONE		200	LANDING		0 90						
05/04/88	415	2	103		NONE		200	CLIMB			BRIGHT			NONE		
05/05/88	468	2	882008		NONE		300	UNKNOWN						NONE		
05/06/88	469	2	882009		NONE		300	TAKEOFF		0				NONE	NO	SEVERAL
05/10/88	1212	1	88		MULT ENG		100	TAKEOFF		0				NONE	NO	SEVERAL
05/11/88	416	2	160	8:46:00	NONE		200	UNKNOWN		0 92			OVERCAST	NONE	NO	SEVERAL
05/11/88	470	1	882010	6:30:00	NONE		300	TAKEOFF					CLEAR	NONE	NO	ONE
05/11/88	471	1	882011	11:05:00	NONE		200	APPROACH			DAWN			NONE	NO	ONE
05/11/88	1251	1	88		NONE		200	TAKEOFF						NONE	NO	SEVERAL
05/15/88	1220	1	94		NONE		200	UNKNOWN		500 140				NONE		
05/17/88	355	1	88		NONE		200	CLIMB								
05/19/88	472	1	882012		NONE		300	TAKEOFF		130			RAIN	NONE	NO	NO
05/20/88	459	2	202	15:14:00	NONE		200	LANDING		0 80			CLEAR	NONE	NO	ONE
05/20/88	731	2	882013		NONE		200	LANDING		0 110			PARTLY CLOUD	NONE	YES	ONE
05/21/88	473	1	88		NONE		300	LANDING						NONE	NO	SEVERAL
05/22/88	1256	2	88	9:00:00	TRVS		200	TAKEOFF		0 110			CLEAR	NONE	NO	SEVERAL
05/22/88	1288	1	88		NONE		200	LANDING						OTHER	NO	
05/23/88	1314	2	88		NONE		200	APPROACH		400 140				ATB		
05/23/88	438	2	94	15:25:00	TRVS		200	TAKEOFF		0 70				ATO		
05/24/88	1306	2	112	9:45:00	MULT BIRDS		200	TAKEOFF		0 110			CLEAR	NONE		SEVERAL
05/25/88	474	1	882014	8:30:00	NONE		300	LANDING		0 125			CLEAR	NONE	NO	FLOCK
05/27/88	1101	1	1704	7:10:00	NONE		200	TAKEOFF		0 120			OVERCAST	NONE	NO	SEVERAL
05/29/88	1260	1	88	14:18:00	MULT BIRDS		200	LANDING		0 130			CLOUDY	NONE	NO	SEVERAL
06/01/88	475	2	882015	12:10:00	NONE		300	LANDING		100 150				NONE		
06/02/88	533	2	210		NONE		200	APPROACH		500 140			CLEAR	NONE	NO	SEVERAL
06/02/88	1227	2	88	12:10:00	MULT BIRDS		200	TAKEOFF		0			CLEAR	ATO	NO	YES
06/04/88	537	2	0		NONE		200	APPROACH								NO
06/06/88	732	2	220		NONE		200	TAKEOFF		0 140			OVERCAST	NONE	NO	NO
06/06/88	732	2	240	15:50:00	NONE		200	UNKNOWN						ATB		
06/07/88	754	2	203		NONE		200	TAKEOFF								
06/08/88	439	1	107	11:42:00	NONE		200	LANDING								
06/08/88	476	1	882016		NONE		300	UNKNOWN								
06/09/88	492	1	143	11:10:00	MULT BIRDS		200	LANDING		0 120			RAIN	NONE	NO	SEVERAL
06/09/88	1221	2	88	13:30:00	NONE		200	TAKEOFF		0 95			CLOUDY	ATO	NO	ONE
06/10/88	1308	2	88		NONE		200	TAKEOFF								
06/10/88	420	1	88	13:25:00	NONE		200	TAKEOFF		0 70			CLEAR	NONE	NO	FLOCK
06/11/88	1261	2	882017	9:05:00	NONE		300	UNKNOWN		500 120			CLEAR	NONE	NO	ONE
06/11/88	1102	2	1705	14:42:00	NONE		200	APPROACH		50 150			CLEAR	NONE		SEVERAL
06/11/88	1273	2	88		NONE		200	TAKEOFF								

DATA SOURCES: ENGINE MANUFACTURER OR ICAO

DATE	EVT#	ENG_POS	BIRD_NAM	BIRD_SPE	# BIRDS	WT_OZ	1	CTY_PRS	AIRPORT	LOCALE	US_INCID	ENGINE	DASH
04/14/88	410	2						-WLG	XFO	WELLINGTON, NEW ZEALAND	NO	JT8D	
04/16/88	1215	2	PIGEON*		1				ALC	ALICANTE, SPAIN	NO	JT8D	
04/16/88	1265	2	WOOD PIGEON		1				SYD	SYDNEY, AUSTRALIA	NO	CFM56	3
04/18/88	1247	2			1				EBCI	GOSSELIES, BELGIUM	NO	CFM56	3
04/19/88	466	2			*				REC	RECIFE, BRAZIL	NO	CFM56	3
04/20/88	1289	2			1				PER	PERTH, AUSTRALIA	NO	CFM56	17
04/21/88	590	2			1				SHI	SHIMIZU, JAPAN	NO	JT8D	9A
04/22/88	749	2			1				HOU	MAR DEL PLATA, ARGENTINA	YES	JT8D	9A
04/24/88	348	2			1				1AD-MSY	HOUSTON, TEX	YES	JT8D	17A
04/25/88	412	2			1				LIT-OKC	WASHINGTON, DC - LA	YES	JT8D	9A
04/26/88	349	2			1				LIT-OKC	LITTLE ROCK, ARK	YES	JT8D	17A
04/26/88	413	2			1				LIT-OKC	LONDON, ENGLAND	YES	JT8D	9A
04/27/88	350	1			1				LIT-OKC	DALLAS/FT WORTH, TEX-LOVE	YES	JT8D	9A
04/27/88	351	1			1				LIT-OKC	TULSA, OKLA	YES	JT8D	9A
04/27/88	467	1			1				DEN-BUR	DENVER, COL	YES	CFM56	3
04/28/88	352	1			1				HOU-	HOUSTON, TEX	YES	JT8D	9A
04/28/88	1319	1			*				ORD-SAB	MADRAS, INDIA	NO	JT8D	15
04/29/88	414	1			1				ORD-SAB	SABA, NETH ANTILLES	NO	JT8D	15
04/29/88	1100	1			1				DEL	DELHI, INDIA	NO	JT8D	15
04/29/88	1303	1	HOODED CROW*		1				SVG	STAVANGER, NORWAY	NO	JT8D	15
04/30/88	1293	1	HERRING GULL		1				RBA	RABAT, MOROCCO	NO	JT8D	15
05/01/88	353	2			1				CGR-GRU	CAMPO GRANDE, BRAZIL	NO	JT8D	17
05/01/88	750	2	POLOVER*		2				OKA-MHY	MIYAKO JIMA, JAPAN	NO	JT8D	15
05/02/88	354	2	BLACK KITE		1				LDE-CRL	LOURDES/TARBES, FRANCE	NO	JT8D	15
05/04/88	415	2			1				WLG	WELLINGTON, NEW ZEALAND	NO	JT8D	3
05/05/88	468	2	ROCK DOVE		1				DAL-HOU	DALLAS/FT WORTH, TEX-LOVE	YES	CFM56	3
05/06/88	469	2	SWAINSON'S THRUSH		1				1.	HOUSTON, TEX	YES	CFM56	3
05/10/88	1212	2			1				CZL	CONSTANTINE, ALGERIA	NO	JT8D	15A
05/11/88	416	2			1				CZL	CONSTANTINE, ALGERIA	NO	JT8D	3
05/11/88	470	1			1				AMS	AMSTERDAM, NETHERLANDS	YES	CFM56	3
05/11/88	471	1	COMMON SWIFT		1				SAT-DAL	SAN ANTONIO, TEX	YES	CFM56	3
05/11/88	1251	2	SWIFT*		1				HAM	HAMBURG, GERMANY	NO	JT8D	15
05/15/88	417	1	SWALLOW*		1				AUS	AUSTIN, TEX	YES	JT8D	15
05/17/88	1220	1			1				BCN	BARCELONA, SPAIN	NO	JT8D	7B
05/17/88	355	1			1				EMR-IAD	NY-WASHINGTON DC	YES	CFM56	3
05/19/88	472	1			1				SAS	SAO PAULO, BRAZIL	YES	JT8D	17
05/20/88	456	2	GULL*		1				MDW	MIDWAY, ILL	YES	JT8D	15
05/20/88	751	2	SWAINSON'S HAWK		1				CDG	PARIS-DE GAULLE, FRANCE	NO	CFM56	3
05/21/88	473	1			1				HOU	HOUSTON, TEX	YES	JT8D	15
05/21/88	1256	2			1				ALG	ALGIERS, ALGERIA	NO	JT8D	15
05/22/88	418	2	HERRING GULL		1				TUN	TUNIS, TUNISIA	NO	JT8D	15
05/22/88	1288	1	KITE*		1				PMI	PATNA, INDIA	NO	JT8D	17
05/22/88	1314	2			1				ZRH	ZURICH, SWITZERLAND	NO	JT8D	17
05/23/88	419	1	COMMON ROCK DOVE		1				DXR	DENVER, COL	YES	JT8D	17
05/24/88	1306	2	PIGEON*		1				LIPZ	LUXOR, EGYPT	NO	JT8D	17
05/24/88	474	1	COMMON TURTLE DOVE		1				OTV	TESSERA, ITALY	NO	CFM56	3
05/27/88	1101	1	GLAUCOUS WINGED GULL		1				HYD	HYDERABAD, INDIA	NO	JT8D	17A
05/29/88	1260	1			1				KEF	KEFLAVIK, ICELAND	NO	JT8D	3
06/01/88	475	2	PIGEON*		1				FRA	FRANKFURT, GERMANY	NO	CFM56	3
06/02/88	533	2			1				ORD	CHICAGO, ILL-OHARE	YES	CFM56	3
06/02/88	1227	2			1				NAP	NAPLES, ITALY	YES	JT8D	15A
06/04/88	577	2	HAWK*		1				ROC	ROCHESTER, NY	YES	JT8D	15A
06/06/88	752	2	NIGHT JAR*		1				COR	CORDOBA, ARGENTINA	NO	JT8D	17
06/06/88	753	2			1				XFO	DUESSELDORF, GERMANY	NO	JT8D	17
06/07/88	754	2			1				DUS	WINNIPEG, CANADA	NO	JT8D	15
06/08/88	439	1			1				YWG	FRESNO, CA	YES	CFM56	3
06/08/88	476	2			1				FAT	BIRMINGHAM, ENGLAND	NO	JT8D	9A
06/08/88	492	2			1				XUS	BIRMINGHAM, ENGLAND	NO	JT8D	9A
06/09/88	1221	2	SKYLARK		1				BHX	BIRMINGHAM, ENGLAND	NO	JT8D	9A
06/09/88	1308	2	CURLEW*		1				TBD	TROMHEIM, NORWAY	NO	JT8D	9A
06/10/88	420	2	WESTERN MEADOWLARK		1				YGR	REGINA, SASK., CANADA	NO	JT8D	3
06/10/88	1261	2			1				CFU	CORFU, GREECE	YES	CFM56	3
06/11/88	576	2			1				-OAK	HYDERABAD, INDIA	NO	JT8D	9A
06/11/88	1102	2			1				HYD	HYDERABAD, INDIA	NO	JT8D	9A
06/11/88	1273	2			1				LTN	LUTON, ENGLAND	NO	JT8D	9A

DATA SOURCES: ENGINE MANUFACTURER OR ICAO

EDATE	EVT#	ENG_POS	DMG_CODE	SEVERITY	POW_LOSS	MAX_VIBE	THROTTLE	IFSD	REMARKS
04/14/88	410	2		9					
04/16/88	1215	1		9					
04/16/88	1265	2		9					
04/18/88	1237	2		9					
04/19/88	466	2	A,D	2	NONE			NO	AM EVENT, REPLACED 2 FAN BLADES
04/20/88	1289	2		9					
04/21/88	490	1		9					
04/22/88	749	2		9					
04/24/88	348	2		9					
04/25/88	412	1		9					
04/26/88	749	1	A,C	3					
04/26/88	749	1		9					
04/26/88	749	1		9					
04/26/88	1246	1		9					
04/27/88	350	1		9					
04/27/88	351	1		9					
04/27/88	467	1		9					
04/28/88	352	1		9					
04/28/88	1319	1		9					
04/29/88	1100	1	A	4				NO	3 F BLDs UNKNOWN DAMAGE
04/29/88	1303	1	A,q	4					
04/30/88	1293	1		9					
05/01/88	353	2		9					
05/01/88	750	1	A,I	0	EPR DEC	HIGH		YES	EGT INCREASED TO FULL SCALE
05/02/88	354	2		9					
05/02/88	455	2	A,B,H	3	NONE			NO	
05/03/88	468	2		9				NO	FOUND DURING GROUND INSPECTION
05/06/88	469	2		9					
05/10/88	1212	2		9					
05/10/88	1212	2	A,C	3					
05/11/88	416	1		9					
05/11/88	471	1	A,B,H	3		3.5		NO	
05/11/88	471	1		9				NO	
05/11/88	1251	2		9					
05/15/88	417	1	A,q	4					
05/17/88	1220	1	A,G	3					
05/19/88	355	1	A,H	3		2.9		NO	PM EVENT, CHANGED 1 FAN BLADE
05/20/88	472	1		9				NO	AM EVENT
05/20/88	456	2		9				NO	
05/21/88	751	2		9					
05/21/88	1256	2	A,C,G,I	9					
05/22/88	418	2		9					
05/22/88	1288	1		9					
05/22/88	1314	2		9					
05/23/88	419	2		9					
05/23/88	438	1	A,C,G,I	1					
05/24/88	1306	2		9					
05/25/88	474	1	A,D,H	2		2.5		NO	FAN ABRADABLE SLIGHTLY DAMAGED
05/27/88	1101	1		9				NO	
05/29/88	1260	1	A,C,K	1				NO	2 BENT F BLDs, 1 COMP BLD DAMAGED
06/01/88	475	2		9					
06/02/88	533	2		9					
06/02/88	1227	2		9					
06/04/88	1247	2	A,H	3				VOLUNTARY	AM EVENT, MEDIUM BIRD, 1 BLADE SHINGLED
06/04/88	752	2	A	3					
06/06/88	753	2	A,G	2				NO	
06/07/88	754	2		9				NO	
06/08/88	439	1		9					
06/08/88	476	1		9					
06/09/88	492	1		9					
06/09/88	1221	2		9					
06/09/88	1308	2	A,q	4					
06/10/88	420	1	A,C	3		HIGH			UNK DAMAGE TO F BLDs
06/10/88	1261	2		9					ODOR, HUM, 3 FAN BLADES DAMAGED
06/11/88	1576	4	A	9				NO	ENGINE REMOVED FOR HIGH EGT
06/11/88	1102	2		9					
06/11/88	1273	2		9					

DATA SOURCES: ENGINE MANUFACTURER OR ICAO

EDATE	EVT#	ENG POS	MFG NO	ETIME	SIGN EVT	AIRCRAFT	POF	ALTITUDE	SPEED	FL RULES	LT CONDS	WEATHER	CREW AC	CREW AL	BIRD SEE
06/12/88	477	2	882017	88	20:30:00	NONE	UNKNOWN	500	155			CLEAR	NONE	NO	SEVERAL
06/12/88	1219	1	88	7:02:00	MULT BIRDS	300	CLIMB	0	125			CLEAR	NONE	NO	ONE
06/12/88	1274	1	88	6:12:00	MULT BIRDS	300	LANDING	0	115			CLOUDY			
06/13/88	478	2	882018	88	20:30:00	NONE	UNKNOWN								
06/13/88	735	1	260		NONE	300	TAKEOFF								
06/13/88	1281	1	88		NONE	300	CLIMB								
06/14/88	440	2	104		NONE	300	TAKEOFF								
06/14/88	479	1	882019	88	20:30:00	NONE	UNKNOWN								
06/14/88	480	2	882020	88	20:30:00	NONE	UNKNOWN								
06/14/88	756	1	230	18:15:00	NONE	300	LANDING	0	70						
06/14/88	1234	1	88	19:31:00	NONE	300	LANDING	0	120			CLEAR	NONE	NO	ONE
06/15/88	481	1	882021	88	20:30:00	NONE	TAKEOFF		+V1						
06/15/88	757	1	220		NONE	300	TAKEOFF	0	10						
06/16/88	441	1	111		NONE	200	OTHER								
06/16/88	584	2	0		NONE	200	UNKNOWN								
06/16/88	584	2	88	21:05:00	NONE	300	TAKEOFF	0	90			CLEAR	ATB	NO	SEVERAL
06/16/88	1217	1	105		MULT BIRDS	300	LANDING						ATB		
06/18/88	442	2	106		NONE	200	TAKEOFF	0	140						
06/18/88	443	1	181		NONE	200	TAKEOFF								
06/18/88	758	1	88	20:28:00	NONE	200	UNKNOWN	0	140			CLOUDY	NONE	NO	ONE
06/19/88	1282	1	88		NONE	200	TAKEOFF								
06/19/88	759	2	260		NONE	200	TAKEOFF	0							
06/20/88	444	1	108		NONE	200	TAKEOFF								
06/20/88	482	1	882022	88	20:30:00	NONE	LANDING		+V1			CLEAR	ATO	NO	FLOCK
06/20/88	483	2	882023	88	7:20:00	MULT BIRDS	300	TAKEOFF	0	115			NONE	NO	SEVERAL
06/20/88	1302	1	113		NONE	200	UNKNOWN	10	130			OVERCAST	NONE	NO	SEVERAL
06/21/88	445	1	882024	88	19:30:00	NONE	UNKNOWN	0	70				NONE	NO	YES
06/22/88	484	2	230		NONE	300	TAKEOFF	0	70			CLEAR	ATB	NO	ONE
06/23/88	1222	1	88		NONE	200	LANDING								
06/23/88	446	1	109		NONE	200	TAKEOFF								
06/23/88	587	1	0		NONE	200	UNKNOWN								
06/23/88	588	1	1706	8:30:00	NONE	300	LANDING								
06/23/88	1103	1	882025	11:00:00	NONE	300	TAKEOFF								
06/26/88	485	1	882026	6:15:00	NONE	300	UNKNOWN								
06/26/88	486	1	88		NONE	300	LANDING								
06/26/88	1268	2	200		NONE	200	UNKNOWN								
06/27/88	493	1	230		NONE	200	UNKNOWN								
06/27/88	761	1	88	20:10:00	NONE	300	APPROACH	600	135			CLOUDY	NONE	NO	SEVERAL
06/27/88	1252	1	882027	11:12:00	NONE	300	APPROACH	4000	210			CLOUDY	NONE	NO	SEVERAL
06/28/88	487	1	882028	11:00:00	NONE	300	UNKNOWN								
06/28/88	488	2	200		NONE	200	UNKNOWN								
06/28/88	494	2	204	7:13:00	NONE	200	TAKEOFF	0	110			CLEAR	NONE	NO	ONE
06/29/88	1104	1	1707	8:00:00	NONE	200	UNKNOWN	50	145			CLEAR	NONE	NO	ONE
06/29/88	1267	2	88	17:02:00	NONE	300	TAKEOFF		150			CLOUDY	ATB	NO	SEVERAL
06/30/88	1255	1	88		NONE	300	CLIMB								
06/30/88	1105	1	1708	20:00:00	MULT BIRDS	200	UNKNOWN								
06/30/88	1105	2	1708	8:44:00	MULT ENG	200	UNKNOWN								
06/30/88	1106	2	1709	7:30:00	MULT ENG	200	UNKNOWN								
07/01/88	497	1	115	20:00:00	NONE	200	LANDING	0	140			OVERCAST	ATB	NO	YES
07/01/88	536	1	883001	8:44:00	NONE	200	TAKEOFF	10	135			CLOUDY	NONE	NO	SEVERAL
07/01/88	1107	2	1710	7:30:00	NONE	300	LANDING	20	135				NONE	YES	
07/01/88	1108	2	1711		NONE	200	CLIMB								
07/01/88	1280	1	88	4:40:00	NONE	200	UNKNOWN								
07/02/88	763	1	230	9:10:00	NONE	200	TAKEOFF	0	100			CLOUDY	NONE	NO	FLOCK
07/02/88	1109	1	1712		NONE	200	TAKEOFF	30	140			OVERCAST	ATO	NO	YES
07/03/88	578	1	0		NONE	300	LANDING								
07/05/88	764	2	260	9:39:00	NONE	200	UNKNOWN	0	120			CLEAR	NONE	NO	FLOCK
07/07/88	1291	2	88		NONE	300	LANDING								
07/07/88	1360	1	1713	15:50:00	NONE	200	LANDING	0	60			CLOUDY	NONE	NO	SEVERAL
07/07/88	1110	2	88	19:45:00	NONE	200	TAKEOFF	20	160			CLEAR	NONE	NO	FLOCK
07/08/88	765	1	208	18:43:00	NONE	200	TAKEOFF	50	160			CLOUDY	NONE	NO	SEVERAL
07/09/88	495	2	117		NONE	200	UNKNOWN								
07/11/88	1233	1	88	6:20:00	NONE	300	LANDING	50	130			RAIN	NONE		SEVERAL
07/12/88	496	1	200		NONE	200	UNKNOWN								
07/12/88	1111	1	1714		NONE	200	UNKNOWN								
07/12/88	766	2	230		NONE	200	UNKNOWN								
07/15/88	498	1	114		NONE	200	TAKEOFF								

DATA SOURCES: ENGINE MANUFACTURER OR ICAO

EDATE	EVT#	ENG_POS	BIRD_NAM	BIRD_SPE	#_BIRDS	WT_OZ_1	CTY_PRS	AIRPORT	LOCALE	US_INCID	ENGINE	DASH
06/12/88	477	2			*			XUS	MADRID, SPAIN	YES	CFM56	3
06/12/88	1219	1	GULL*		*			MAD	LUTON, ENGLAND	NO	JT8D	
06/12/88	1274	1			*			BRS-CWL	BRISTOL, ENGLAND	NO	CFM56	3
06/13/88	478	2			*				TAIWAN	NO	CFM56	3
06/13/88	755	1	SILVER GULL	14N32				XFO	TAIWAN	NO	JT8D	7A
06/13/88	1281	2						MEL	MELBOURNE, AUSTRALIA	NO	CFM56	17
06/14/88	440	2						YUL-YOW	MONTREAL, CANADA	NO	JT8D	3
06/14/88	479	1						-FRA	FRANKFURT, GERMANY	NO	CFM56	3
06/14/88	480	2	HAWK*					BNE	BRISBANE, AUSTRALIA	NO	CFM56	17
06/14/88	756	1			1			OKA-MMY	MIYAKO JIMA, JAPAN	NO	CFM56	3
06/14/88	1254	1						LHR	LONDON, ENGLAND	NO	CFM56	17
06/15/88	481	1						EWR-ORD	NEW YORK NY-NEWARK	YES	CFM56	3
06/15/88	757	1	GULL*		1			RES	RESISTENCIA, ARGENTINA	YES	CFM56	3
06/16/88	441	1						-GIG	RIO DE JANEIRO, BRAZIL	NO	JT8D	9
06/16/88	584	2						PTY	PANAMA CITY, PANAMA	NO	JT8D	9
06/16/88	1217	2	BONAPARTE'S GULL	14N38	*			LGRX	ARAXOS, GREECE	NO	JT8D	9A
06/18/88	442	2		14N14	*			YKA	KAMLOOPS, CANADA	NO	JT8D	9A
06/18/88	443	2	HERRING GULL		1			YVT	ST. JOHN'S, CANADA	NO	JT8D	15
06/18/88	758	1						XFO	BELGIUM	NO	JT8D	15
06/18/88	1282	1			1			LEMH	MENORCA, SPAIN	NO	JT8D	7A
06/19/88	759	2						XFO	TAIWAN	NO	JT8D	7A
06/20/88	444	1						RUH-ANB	RIYADH, SAUDI ARABIA	NO	JT8D	3
06/20/88	446	1	PIGEON*		1			PME-PME	PORTSMOUTH, ENGLAND	NO	CFM56	3
06/20/88	483	2	PIGEON*		*			PME-PMI	PORTSMOUTH, ENGLAND	NO	CFM56	3
06/20/88	1302	1	GULL*		*			LGSK	SKIATHOS, GREECE	NO	JT8D	
06/21/88	445	1						-OKC	OKLAHOMA CITY, OKLA	YES	CFM56	3
06/22/88	484	2	CATTLE EGRET	1135	1			XUS	JAPAN	YES	CFM56	17
06/22/88	760	2			*			ISG-OKA	BODO, NORWAY	NO	JT8D	17
06/23/88	1222	2	GULL*					XFO	THUNDER BAY, CANADA	NO	JT8D	9A
06/24/88	446	2						YQT-YAM	BOSTON, MASS	YES	CFM56	3
06/25/88	587	1	KITE*					GLE-BOC	JAMMU, INDIA	NO	CFM56	17A
06/25/88	1103	1						IXC-XJ IX	MILAN-MALPENSA, ITALY	NO	CFM56	3
06/26/88	485	1			*			MYR-FUE	BREMEN, GERMANY	NO	CFM56	3
06/26/88	484	1	KITE*					-BRE	LAHORE, PAKISTAN	NO	CFM56	17
06/26/88	1288	2						LHE	NAGOA, JAPAN	NO	JT8D	17
06/27/88	493	2						NGO	JAPAN	NO	JT8D	17
06/27/88	761	1			1			OKA-MMY	CORFU, GREECE	NO	CFM56	3
06/27/88	1262	1	COMMON LAPWING	5N1	1			STR-SCN	SAARBUECKEN, GERMANY	NO	CFM56	3
06/28/88	487	2			1			CTU-SHA	CHINA	NO	CFM56	3
06/28/88	488	2						XFO	YAMAGATA, HONSHU, JAPAN	NO	JT8D	17
06/28/88	494	2	SPARROW*		1			GAI	NUREMBERG, GERMANY	NO	JT8D	15
06/28/88	762	2			*			NUE-HAM	INDIA	NO	JT8D	9A
06/29/88	1104	1						JDH-JAI	MILAN, ITALY	NO	CFM56	3
06/29/88	1267	2	SHALLOW*					MUC	MUNICH, GERMANY	NO	CFM56	3
06/29/88	1285	1						DEL-JAI	INDIA	NO	JT8D	9A
06/30/88	1105	2			1			DEL-JAI	INDIA	NO	JT8D	9A
06/30/88	1106	2	VULTURE*		1			DUS-VIE	KATHMANDU, NEPAL	NO	CFM56	3
07/01/88	497	1	GULL*	14N14	*			DUS	DUESSELDORF, GERMANY	NO	JT8D	9A
07/01/88	536	1	HERRING GULL					BRU-CDG	PARIS-DE GAULLE, FRANCE	NO	CFM56	17A
07/01/88	1107	2						CDG	JAIPUR, INDIA	NO	JT8D	17A
07/01/88	1108	2	OWL*					JAI	INDIA	NO	CFM56	3
07/01/88	1280	1						XFO	MANCHESTER, ENGLAND	NO	JT8D	17
07/02/88	763	1	PARTRIDGE*		1			OKA-MMY	COIMBATORE, INDIA	NO	JT8D	17
07/02/88	1109	1	PIGEON*		1			CJB	DALLAS/FT. WORTH, TEX	YES	CFM56	3
07/03/88	578	2			*			DFW	TAIWAN	NO	JT8D	9A
07/03/88	764	2	SHALLOW*					XFO	PREVEZA, GREECE	NO	CFM56	17
07/05/88	1291	1						PKV	MONTREAL, CANADA	NO	JT8D	17A
07/07/88	447	2	KITE*		1			YHZ-YUL	PATNA, INDIA	NO	JT8D	17A
07/07/88	1110	2						LKO-PAT	MULGA, TURKEY	NO	JT8D	17A
07/07/88	1286	1	SHALLOW*		1			TRN-FRA	TURIN, ITALY	NO	JT8D	15
07/08/88	765	1			*			TRN	NASHVILLE, TENN	YES	JT8D	9A
07/09/88	495	2						-BNA	COOLANGATTA, AUSTRALIA	NO	CFM56	3
07/11/88	1233	1						ABG	TOTTORI, JAPAN	NO	JT8D	17
07/12/88	496	1						TJJ	INDIA	NO	JT8D	9A
07/12/88	1111	1						-BOM	JAPAN	NO	JT8D	17
07/14/88	766	2						ISG-OAK	KELOWNA, CANADA	NO	JT8D	9A
07/15/88	498	1						YLV-YVR		NO	JT8D	9A

DATA SOURCES: ENGINE MANUFACTURER OR ICAO

EDATE	EVT#	ENG POS	DMG CODE	SEVERITY	POW LOSS	MAX VIBE	THROTTLE	IFSD	REMARKS
06/12/88	477	2		9	NONE			NO	FOUND DURING GROUND INSPECTION
06/12/88	1219	1		9					
06/12/88	1274	1		3	NONE			NO	1 FAN BLADE BLEND ON WING
06/13/88	478	2	A,B	3					SYNPTON-EGT
06/13/88	755	1	A,C	3					FOUND DURING GROUND INSPECTION
06/13/88	1281	2		9					
06/14/88	479	1	A,C	3	NONE			NO	
06/14/88	480	2		9	NONE			NO	
06/14/88	756	1		9					
06/14/88	1254	1	A,C	3				NO	
06/15/88	481	1		9	NONE				
06/15/88	757	1		3					
06/16/88	482	1	A,K	9					2 1ST STG COMPRESSOR BLADES DAMAGED
06/16/88	758	1		9					
06/18/88	442	2	A,C,G,I	1	COMPRESSOR	HIGH			METAL IN TAILPIPE SYNPTON-EGT, 2 BLADES
06/18/88	443	2	A,D,N	1					4 FAN BLADES DAMAGED, ODOOR
06/18/88	758	1	A,G,N	2					
06/18/88	1282	1	A,K,Q	2	COMPRESSOR				F BLD, 2ND + 6TH STG COMP UNK UNK DAMAGE
06/19/88	759	2	A,D	2	COMPRESSOR				5 FAN BLADES BLEND ON WING
06/20/88	444	1		3					
06/20/88	482	1	A,H	3					M/S SHROUD DISTORTED, CSD COOLER CLOGGED
06/20/88	483	2	A,H	3	NONE	SOME		NO	ODOOR
06/20/88	1302	1		9					FOUND DURING GROUND INSPECTION
06/21/88	445	1		4	NONE				BENT F BLD # UNK
06/22/88	484	1	A	9					ODOOR IN CABIN
06/23/88	760	1	A,D	2					
06/23/88	1222	2	A,C	3	COMPRESSOR				REPLACED 5 PAIR OF FAN BLADES
06/24/88	446	1		9					REPLACED 3 PAIR OF FAN BLADES
06/25/88	587	1		3					
06/25/88	1103	1		9		2.6			
06/26/88	485	1	A,B	3	NONE				
06/26/88	486	1	A	4	NONE				
06/26/88	1268	2		9					
06/27/88	761	1		9					
06/27/88	1262	1		9					
06/28/88	487	1	A,H	3	NONE				ENGINE NOISE
06/28/88	488	2	A,K	3	NONE				FOUND DURING GROUND INSPECTION, UER
06/28/88	494	2		9					
06/28/88	762	1		9	NONE				FOUND ON GRD INSPC
06/29/88	1104	2		9					
06/29/88	1267	1	A,C	3					
06/30/88	1285	1		9					FOUND ON GRD INSPC
06/30/88	1105	1		9					FOUND ON GRD INSPC
06/30/88	1106	2	A,H	3					4 F BLD SHINGLED
06/30/88	497	1	A,D,K,N	1					2 BLD BROKEN TANGS SEVERE COMP BLD DAM
07/01/88	536	1	A,D,H	2					REPLACED 5 PAIR OF FAN BLADES
07/01/88	1107	2	A	3					2 F BLD UNK DAMAGE
07/01/88	1108	2	A,C,G,K	4					FBLDS DAMAGED, 7TH+8TH STG BLD DAMAGE
07/01/88	1280	1		9					
07/02/88	763	1		9					
07/02/88	1109	1		9					
07/03/88	578	1		9					
07/03/88	764	2	A,D	2					MEDIUM BIRD
07/05/88	1291	1		9					4 FAN BLADES BLEND ON WING
07/07/88	447	2	A,H	3					
07/07/88	1110	2		9					2 F BLD SHINGLED
07/07/88	1286	1		9					
07/08/88	765	1		9					ODOOR
07/09/88	495	2		9					
07/11/88	1233	1		9					
07/12/88	496	1		9					
07/12/88	1111	1	A,H	3					FOUND ON GRD INSPC
07/14/88	766	2		9					
07/15/88	498	1		9					

DATA SOURCES: ENGINE MANUFACTURER OR ICAO

EDATE	EVT#	ENG_POS	MFG NO	ETIME	SIGN EVT	AIRCRAFT	POF	ALTITUDE	SPEED	FL RULES	LT CONDS	WEATHER	CREW AC	CREW AL	BIRD SEE
07/15/88	499	2	118		NONE	200	UNKNOWN		+V1	VFR		CLEAR	NONE		NO FLOCK
07/15/88	537	1	883002	19:48:00	NONE	300	TAKEOFF		0 120			OVERCAST	NONE	NO	ONE
07/15/88	767	1	209		NONE	200	LANDING		0 80			OVERCAST	ATO		ONE
07/15/88	1112	2	1715	11:50:00	NONE	200	LANDING		0 100			CLOUDY	NONE		NO
07/15/88	1252	2	88		NONE	300	LANDING		0						SEVERAL
07/16/88	538	2	883003		NONE	200	UNKNOWN					CLEAR	NONE	NO	YES
07/16/88	768	2	260		NONE	200	LANDING		30 125			CLEAR	NONE	NO	SEVERAL
07/16/88	1255	2	88	9:40:00	MULT	200	LANDING		0 120			CLEAR	NONE	NO	ONE
07/16/88	1310	2	88	20:15:00	NONE	200	LANDING		50 120		DAY	CLEAR	NONE	NO	SEVERAL
07/18/88	500	2	122		NONE	200	LANDING		0						ONE
07/18/88	501	2	138	15:45:00	NONE	200	TAKEOFF								NO
07/18/88	502	2	139	19:30:00	NONE	200	TAKEOFF								SEVERAL
07/19/88	503	2	200		NONE	200	UNKNOWN		0 120			CLEAR	NONE	NO	SEVERAL
07/19/88	1317	2	88	5:04:00	NONE	200	TAKEOFF								ONE
07/19/88	1320	2	0		NONE	200	TAKEOFF								NO
07/20/88	529	2	883004		NONE	300	CLIMB		100		BRIGHT	CLEAR	NONE	NO	SEVERAL
07/20/88	540	1	883005	11:25:00	NONE	300	LANDING						ATO		NO
07/20/88	1307	1	88		NONE	100	TAKEOFF						NONE		SEVERAL
07/21/88	504	1	200		NONE	200	UNKNOWN								NO
07/21/88	588	1	0		NONE	300	UNKNOWN								NO
07/21/88	588	1	119		NONE	300	APPROACH								NO
07/21/88	588	1	883006		NONE	300	CLIMB								NO
07/21/88	588	1	883007		NONE	300	UNKNOWN								NO
07/21/88	588	1	260		NONE	200	UNKNOWN								NO
07/21/88	588	1	88	6:00:00	NONE	300	TAKEOFF		0 80			RAIN	NONE	NO	SEVERAL
07/21/88	588	1	883008	8:15:00	NONE	300	TAKEOFF						ATO		SEVERAL
07/21/88	588	1	132		INV POW LOSS	200	TAKEOFF		0 120			CLOUDY	ATO	NO	SEVERAL
07/21/88	588	1	88	7:02:00	MULT	200	TAKEOFF		70 140			CLEAR	ATO	NO	SEVERAL
07/21/88	588	1	123	22:10:00	INV POW LOSS	300	TAKEOFF		+V1				ATO		SEVERAL
07/21/88	588	1	883009		NONE	300	TAKEOFF		0 140			CLEAR	NONE		SEVERAL
07/21/88	588	1	883010	15:20:00	MULT	300	CLIMB		3500 250			CLEAR	NONE		SEVERAL
07/21/88	588	1	88	21:00:00	NONE	200	LANDING		10 130			CLEAR	NONE		SEVERAL
07/21/88	588	1	133	17:40:00	NONE	200	TAKEOFF		1500 180			CLEAR	NONE	NO	ONE
07/21/88	588	1	0		NONE	200	APPROACH		800 170			CLOUDY		NO	ONE
07/21/88	588	1	88	11:21:00	NONE	200	UNKNOWN						ATO	NO	SEVERAL
07/21/88	588	1	121		NONE	100	TAKEOFF		0 100			CLEAR	NONE	NO	SEVERAL
07/21/88	588	1	88	8:17:00	MULT	300	LANDING		0 40			CLEAR	NONE	NO	ONE
07/21/88	588	1	883011	15:00:00	NONE	200	APPROACH								SEVERAL
07/21/88	588	1	141		NONE	200	LANDING								SEVERAL
07/21/88	588	1	142		NONE	200	LANDING								SEVERAL
07/21/88	588	1	88	13:00:00	NONE	300	APPROACH		50 140			CLEAR	NONE	NO	SEVERAL
07/21/88	588	1	88	14:00:00	NONE	200	LANDING		0 90			CLEAR	NONE	NO	SEVERAL
07/21/88	588	1	1716	1:55:00	NONE	300	APPROACH		0 145			CLEAR	NONE	NO	SEVERAL
07/21/88	588	1	883012		NONE	200	UNKNOWN								SEVERAL
07/21/88	588	1	883013		NONE	300	APPROACH								SEVERAL
07/21/88	588	1	1717	17:55:00	NONE	200	LANDING		5 130			OVERCAST	NONE	NO	SEVERAL
07/21/88	588	1	1603		NONE	200	UNKNOWN		0			CLEAR	NONE	NO	SEVERAL
07/21/88	588	1	116		NONE	200	TAKEOFF						DIV	NO	ONE
07/21/88	588	1	151	9:46:00	NONE	200	TAKEOFF		0 110		VFR	CLEAR	NONE	NO	ONE
07/21/88	588	1	211		NONE	200	UNKNOWN					CLEAR	NONE	NO	ONE
07/21/88	588	1	1718	16:03:00	NONE	200	TAKEOFF		225 136			CLEAR	NONE	NO	ONE
07/21/88	588	1	124		NONE	200	TAKEOFF								SEVERAL
07/21/88	588	1	230		NONE	200	UNKNOWN								SEVERAL
07/21/88	588	1	88	14:48:00	MULT	300	TAKEOFF		0 122			CLOUDY	NONE		SEVERAL
07/21/88	588	1	88	9:48:00	NONE	100	LANDING		0 150			RAIN	NONE	NO	SEVERAL
07/21/88	588	1	125		NONE	200	TAKEOFF		0 50			CLEAR	NONE	NO	SEVERAL
07/21/88	588	1	1719		NONE	200	LANDING					OVERCAST	NONE	NO	SEVERAL
07/21/88	588	1	126		NONE	200	UNKNOWN								SEVERAL
07/21/88	588	1	127		NONE	200	UNKNOWN								SEVERAL
07/21/88	588	1	134		NONE	200	TAKEOFF								SEVERAL
07/21/88	588	1	0	7:13:00	NONE	200	TAKEOFF		0 120		DAY	PARTLY CLOUD	ATO	NO	ONE
07/21/88	588	1	193	8:50:00	NONE	200	TAKEOFF		0 123			CLEAR	NONE	NO	ONE
07/21/88	588	1	230		NONE	200	TAKEOFF								ONE

DATA SOURCES: ENGINE MANUFACTURER OR ICAO

DATE	EVT#	ENG POS	BIRD NAM	BIRD SPE	# BIRDS	WT OZ	1	CTY	PRS	AIRPORT	LOCALE	US	INCID	ENGINE	DASH
07/15/88	499	2			1			BRR-ANC	XFO		SCOTLAND-ALASKA	NO		JT80	17A
07/15/88	537	1			1			8. MAD-STR	LJU		LJUBLJANA, YUGOSLAVIA	NO		CFM56	3
07/15/88	767	1	EURASIAN KESTREL	5K27	1			GWL-BHO	GWL		GWALTIGART, INDIA	NO		JT80	15
07/15/88	1112	1	HAWK*		1				HAM		HAMBURG, GERMANY	NO		JT80	17
07/15/88	1252	2	BLACK-HEADED GULL	14N36	1			8.8	BRU		BRUSSELS, BELGIUM	NO		CFM56	3
07/16/88	768	2			1				XFO		TAIWAN	NO		JT80	7A
07/16/88	1245	2	PIGEON*		*				OSL		OSLO, NORWAY	NO		JT80	7A
07/16/88	1310	1	GULL*		1				AES		ALESUND, NORWAY	NO		JT80	7A
07/18/88	500	2	BLACK BIRD*		1			40.	PHL		PHILADELPHIA, PA	YES		JT80	15
07/18/88	501	2	EURASIAN KESTREL	5K27	1			8.	BRU-LHR	BRU	BRUSSELS, BELGIUM	NO		JT80	15A
07/18/88	502	1			1				CAG		CAGLIARI, ITALY	NO		JT80	15
07/18/88	503	2			1				SDJ		SENDAI, JAPAN	NO		JT80	9A
07/19/88	1317	1	EUROPEAN SPARROW HAWK	3K103	1			6.7	BRU		BRUSSELS, BELGIUM	NO		JT80	9A
07/19/88	1320	2			1				TUL		TULSA, OK	YES		JT80	9A
07/20/88	1259	2			1				BEG		BELGRADE, YUGOSLAVIA	NO		CFM56	3
07/20/88	1307	1	CARRION CROW	22Z94	1			19.	CDG-AMS	AMS	AMSTERDAM, NETHERLANDS	NO		CFM56	3
07/21/88	504	1			1				KOJ		KOGOSHIMA, JAPAN	NO		JT80	9A
07/21/88	588	1			1				-DEN XUS		COL	YES		CFM56	3
07/23/88	505	1	CHIMNEY SWIFT	1U33	1			1.	YVR-YLW	YLM	KELOHNA, CANADA	NO		JT80	9A
07/23/88	541	1			1				SAN		SAN DIEGO, CA	YES		CFM56	3
07/23/88	542	1			1				XUS		TAIWAN	NO		CFM56	7A
07/23/88	769	1			1				XFO		PARIS, FRANCE	NO		JT80	7A
07/23/88	1229	2			1				CDG		BRUSSELS, BELGIUM	NO		CFM56	3
07/24/88	543	2			1				BRU-CDG	BRU	PORTO VELHO, BRAZIL	NO		JT80	3
07/25/88	506	2	GREY EAGLE-BUZZARD	3K161	1			80.	PVH		BRUSSELS, BELGIUM	NO		JT80	7
07/25/88	1224	2			1				PLZ		PORT ELIZABETH, S. AFRICA	NO		JT80	9
07/26/88	507	2			1				LHE		LAHORE, PAKISTAN	NO		CFM56	3
07/26/88	544	2			1				CWL		CARDIFF, WALES	NO		CFM56	3
07/26/88	545	2			1				FAO		FARO, PORTUGAL	NO		JT80	7
07/26/88	1243	2			1				LTN		LUTON, ENGLAND	NO		JT80	7
07/26/88	1275	2			1				CGR-GRU	GRU	CAMPO GRANDE, BRAZIL	NO		JT80	7
07/27/88	508	2			1				BNA		NASHVILLE, TENN	YES		JT80	17A
07/27/88	586	1	BURROUING OWL	2S102	1				YVR		FAROE ISLANDS, DENMARK	NO		JT80	17A
07/28/88	1309	1	HERRING GULL	14N14	1			5.	NCE		VANCOUVER, CANADA	NO		JT80	17A
07/28/88	1355	1			1			40.	BNJ		NICE, FRANCE	NO		JT80	17A
07/28/88	1266	2	HAWK*		1				AMS		BONN, GERMANY	NO		CFM56	3
07/29/88	546	2	COMMON SWIFT	1U55	1			2.	YSH-YHY	YHY	AMSTERDAM, NETHERLANDS	NO		CFM56	3
07/30/88	510	1			1				FRA		HAY RIVER, CANADA	NO		JT80	9A
07/30/88	511	2			1				YVR		VANCOUVER, CANADA	NO		JT80	9A
07/30/88	1315	2			1				LOW		WIEN-SCHNECH, OSTERREICH	NO		CFM56	3
07/31/88	1312	1	SPARROW*		1				DEL-AGR	AGR	AGRA, INDIA	NO		JT80	17
08/01/88	1113	1	BARN OWL	1S2	1			11.25	LIS		LISBON, PORTUGAL	NO		JT80	17
08/01/88	1269	1			1				BRU		BRUSSELS, BELGIUM	NO		CFM56	3
08/05/88	547	1			1				NCE		FRANCE	NO		CFM56	3
08/05/88	548	1			1				COK		COCHIN, INDIA	NO		JT80	17
08/05/88	1114	2			1				DUR-PLZ	DUR	DURBAN, S. AFRICA	NO		JT80	17A
08/07/88	512	1	GULL*		1			4.	YXJ-YXJ	YXJ	FT. ST. JOHN, CANADA	NO		JT80	17A
08/07/88	513	2			1				DUS-LIN	DUS	DUESSELDORF, GERMANY	NO		JT80	9A
08/07/88	770	2	BUZZARD*		1			32.	AGR	PLZ	AGRA, INDIA	NO		JT80	15
08/07/88	1006	2			1				YWG-YVR	YWG	WINNEPEG, CANADA	NO		JT80	17
08/07/88	1248	2			1				XFO		JAPAN	NO		JT80	17A
08/09/88	514	2			1				BFS		BELFAST, N. IRELAND	NO		JT80	17
08/09/88	830	2	HOUSE MARTIN	18Z69	1			0.5	BFS		BELFAST, N. IRELAND	NO		CFM56	3
08/09/88	1217	1			1				YMH-YXD	YMH	PARIS, FRANCE	NO		JT80	9A
08/09/88	1218	1			1				YXR-YXD	YXR	CHANDIGARH, INDIA	NO		JT80	17A
08/10/88	1230	1	VULTURE*		1				XFO		CANADA	NO		JT80	9A
08/10/88	515	1			1				HOU		HOUSTON, TEX	YES		JT80	17A
08/11/88	516	1	LITTLE RINGED PLOVER	5N31	1			1.	SYR-IAD	SYR	SYRACUSE, NY	YES		JT80	17A
08/12/88	517	1			1			4.	BFN-KTM	MMY	BLOENFONTEIN, S. AFRICA	NO		JT80	17A
08/12/88	518	2	MOURNING DOVE	2P105	1						MIYAKO JIMA, JAPAN	NO		JT80	17
08/13/88	565	1			1									JT80	17
08/13/88	771	1			1									JT80	17
08/13/88	772	2			1									JT80	17

DATA SOURCES: ENGINE MANUFACTURER OR ICAO

DATE	EVT#	ENG_POS	DMG_CODE	SEVERITY	POW_LOSS	MAX_VIBE	THROTTLE	IFSD	REMARKS
07/15/88	499	2		9	NONE			NO	FOUND DURING GROUND INSPECTION
07/15/88	537	1		9	NONE			NO	AM EVENT
07/15/88	767	1		9				NO	
07/15/88	1112	1		9				NO	
07/15/88	1252	2		9				NO	
07/15/88	538	2		9				NO	
07/16/88	768	2	A, D	9	NONE			NO	12 FAN BLADES REPLACED
07/16/88	1245	2		9					
07/16/88	1310	2		9					
07/16/88	500	2	A, D	3		HIGH			INVESTIGATED, AM EVENT
07/18/88	501	2	A, C	2					
07/19/88	502	2	A, C, G	2		HIGH		NO	CREW NOTED NOISE AND VIBES AT TO
07/19/88	503	1		9					
07/19/88	504	2		9					
07/19/88	1317	2	A, H	9				NO	
07/19/88	1320	2		9				NO	
07/20/88	539	2		9	N1 DECREASE			NO	MOMENTARY 10% DEC. IN FAN SPEED
07/20/88	540	1	A, B	3	NONE			NO	4 F BLADES HAD LE TIP CURL
07/20/88	1307	1		9					
07/21/88	504	1		9					
07/21/88	508	1		9					FOUND ON GRD INSPECTION, BLOOD ON COML
07/21/88	509	1		9					
07/23/88	541	1	A, H	3	NONE	3.0		NO	3 F BLADES SHINGLED, 1 BLADE REPLACED
07/23/88	542	1		9	NONE			NO	FOUND DURING LTR CHECK
07/23/88	769	2	A, D	4				NO	5 FAN BLADES BLENDING ON WING
07/23/88	1229	2	A, Q	2				NO	1 F BLD UNK DAM
07/24/88	543	1	A, H	3	NONE	3.0		NO	REPLACED 3 PAIR OF FAN BLADES
07/25/88	504	1	A, H, I, K	1	COMPRESSOR			YES	1 F BLADE FRACTURED BELOW MSS
07/25/88	1224	2		9					
07/25/88	1224	2		9	COMPRESSOR			YES	MOMENTARY THRUST LOSS FOR APPROX. 10 SEC
07/26/88	507	1	A, H	3	NONE	HIGH		NO	
07/26/88	544	1	A, B, H	3	NONE	5.0		NO	
07/26/88	545	1		9		NONE			
07/26/88	1243	2		9					
07/26/88	1243	2		9					
07/27/88	508	1		9					ODOR IN CABIN, SMALL BIRD
07/27/88	508	1		9					SMALL BIRD
07/27/88	1309	1		9					
07/27/88	1309	1	A, C, H, K	1					
07/28/88	1235	2	A, Q	1					HPC DAMAGED AND REMOVED
07/28/88	1235	2		9					4 F BLS UNK DAM
07/28/88	1266	2		9				NO	BSI FOUND HPC STG6 BLD WITH A NICK
07/29/88	546	2	A	4	NONE				SMALL BIRD
07/30/88	510	1		9					
07/30/88	511	1		9					
07/30/88	1315	1		9					
07/31/88	1315	1		9				NO	
08/01/88	1113	1		9				NO	
08/01/88	1269	1	A, Q	4		2.0		NO	6 FAN BLADES REPLACED
08/05/88	547	1	A, H	3	NONE			NO	ODOR
08/05/88	548	1		9	NONE			NO	4 F BLS UNK DAMAGE
08/05/88	1114	2	A	4				NO	
08/05/88	1188	1		9				NO	
08/07/88	513	2		9				NO	MOMENTARY SMALL DROP IN EPR
08/07/88	513	2		9				NO	2 F BLS SHINGLED
08/07/88	770	2	A, H	3					ODOR IN CABIN, SMALL BIRD
08/07/88	1006	2		9					
08/07/88	1248	2		9					
08/09/88	514	2		9					
08/09/88	514	2		9					
08/09/88	530	1		9					
08/09/88	1313	1		9					
08/09/88	1313	1		9					
08/09/88	1214	1		9					
08/09/88	1230	1		9					
08/10/88	515	1		9				NO	4 F BLS SHINGLED
08/10/88	1007	1	A, H	3					FOUND DURING GROUND INSPECTION
08/11/88	516	1		9					FOUND DURING GROUND INSPECTION
08/11/88	516	1		9					
08/12/88	518	2		9					
08/12/88	518	2		9					
08/13/88	565	1		9					SMALL BIRD
08/13/88	771	1		9					
08/13/88	772	2		9					

DATA SOURCES: ENGINE MANUFACTURER OR ICAO

EDATE	EVT#	ENG POS	MFG	NO	ETIM	SIGN	EVT	AIRCRAFT	POF	ALTITUDE	SPEED	FL RULES	LT COND	WEATHER	CREW AC	CREW AL	BIRD	SEE
08/13/88	1008	2	1720	883014	19:14:00	NONE		200	LANDING						NONE			
08/14/88	549	1	883014	18:27:00	NONE			300	UNKNOWN						NONE		NO	
08/14/88	773	1	212	18:27:00	NONE			200	LANDING						NONE		ONE	
08/15/88	519	1	128		NONE			200	UNKNOWN						NONE			
08/15/88	520	1	129		NONE			200	UNKNOWN						NONE			
08/15/88	550	2	883015	21:45:00	MULT	BIRDS		300	UNKNOWN						NONE			
08/15/88	581	2	0		NONE			200	CRUISE						ATB			
08/15/88	774	2	260		NONE			200	UNKNOWN						NONE			
08/15/88	1009	1	1721		NONE			200	UNKNOWN						NONE			
08/16/88	521	1	154		NONE			200	TAKEOFF						NONE			
08/16/88	521	2	883016	15:45:00	MULT	BIRDS		300	TAKEOFF						ATB			
08/17/88	532	2	883017		NONE			300	UNKNOWN						NONE			
08/18/88	553	2	883018		NONE			300	UNKNOWN						NONE			
08/18/88	1298	2	88		NONE			100	TAKEOFF						ATB	YES		
08/19/88	522	1	135		NONE			200	TAKEOFF						ATO			
08/19/88	554	1	883019		NONE			300	CLIMB						NONE		NO	
08/19/88	1010	2	1722		NONE			200	TAKEOFF						ATO		ONE	
08/19/88	1011	1	1723		NONE			200	TAKEOFF						NONE		ONE	
08/20/88	1287	1	88	20:26:00	NONE			200	LANDING						NONE			
08/20/88	1294	2	88	9:20:00	NONE			200	TAKEOFF						NONE		SEVERAL	
08/21/88	555	1	883020	8:52:00	NONE			100	TAKEOFF						ATO		ONE	
08/21/88	1012	2	1724		NONE			200	TAKEOFF						ATB	YES	NO	
08/21/88	1012	2	88		NONE			200	CLIMB						NONE			
08/22/88	1055	1	88	12:30:00	NONE			100	LANDING						NONE		ONE	
08/23/88	1253	1	88	6:20:00	NONE			200	TAKEOFF						NONE		ONE	
08/23/88	1253	2	131	6:18:00	MULT	ENG		200	TAKEOFF						NONE		SEVERAL	
08/24/88	1187	2	131	6:18:00	MULT	ENG		200	TAKEOFF						ATO		SEVERAL	
08/26/88	524	1	136	8:50:00	NONE			200	APPROACH						NONE		SEVERAL	
08/26/88	556	1	883022		MULT	BIRDS		200	TAKEOFF						NONE		SEVERAL	
08/26/88	556	2	883022		MULT	ENG		300	TAKEOFF						NONE		SEVERAL	
08/26/88	556	2	883021		MULT	ENG		300	TAKEOFF						NONE		SEVERAL	
08/28/88	1013	1	1725		NONE			200	UNKNOWN						NONE		NO	
08/28/88	1013	2	88		NONE			200	TAKEOFF						NONE			
08/29/88	557	2	883024	8:43:00	MULT	ENG-BIRDS		300	TAKEOFF						ATO		FLOCK	
08/29/88	557	2	883023	8:43:00	MULT	ENG-BIRDS		300	TAKEOFF						ATB	NO	FLOCK	
08/29/88	1014	2	1726		NONE			200	UNKNOWN						NONE		SEVERAL	
08/29/88	1313	1	88	14:56:00	NONE			100	APPROACH						NONE			
08/30/88	525	1	152		NONE			200	UNKNOWN						NONE		NO	
08/30/88	558	1	883025	14:30:00	NONE			300	UNKNOWN						NONE		NO	
08/31/88	776	1	260		NONE			200	UNKNOWN						NONE			
09/01/88	1186	2	1639		NONE			200	UNKNOWN						NONE			
09/01/88	1255	2	88	7:12:00	NONE			200	TAKEOFF						NONE		FLOCK	
09/01/88	1255	2	88	7:12:00	MULT	ENG-BIRDS		200	TAKEOFF						ATO	NO	FLOCK	
09/01/88	1277	1	88	14:50:00	MULT	ENG-BIRDS		100	TAKEOFF						ATO	NO	FLOCK	
09/01/88	1277	2	88	14:50:00	MULT	ENG-BIRDS		100	TAKEOFF						ATO	NO	FLOCK	
09/02/88	559	1	883026	13:00:00	NONE			300	UNKNOWN						NONE		NO	
09/03/88	560	2	883027		NONE			300	UNKNOWN						NONE		NO	
09/03/88	563	1	0		NONE			300	UNKNOWN						NONE		NO	
09/04/88	563	2	153		NONE			200	APPROACH						NONE		NO	
09/04/88	561	1	883028		NONE			300	UNKNOWN						NONE		ONE	
09/04/88	1015	2	1727	7:16:00	NONE			200	TAKEOFF						ATO	NO	ONE	
09/05/88	562	1	883029		NONE			300	TAKEOFF						ATB	NO	NO	
09/05/88	1017	1	1729		NONE			200	UNKNOWN						NONE		NO	
09/05/88	1311	1	88	13:59:00	MULT	ENG-BIRDS		200	LANDING						NONE		FLOCK	
09/05/88	1311	2	88	13:59:00	MULT	ENG-BIRDS		200	LANDING						NONE		FLOCK	
09/06/88	563	2	883030		NONE			300	TAKEOFF						NONE		NO	
09/07/88	777	2	230		NONE			200	TAKEOFF						NONE		YES	
09/07/88	1226	1	88		NONE			300	TAKEOFF						NONE		YES	
09/08/88	564	2	883031	9:40:00	NONE			300	LANDING						NONE		NO	
09/08/88	1018	1	1730	11:00:00	MULT	BIRDS		200	TAKEOFF						ATB	NO	ONE	
09/08/88	1263	1	88		TRVS	FRAC		200	TAKEOFF						ATB	NO	ONE	
09/08/88	1263	2	88		NONE			200	LANDING						NONE		NO	
09/09/88	527	1	144	8:39:00	NONE			200	TAKEOFF						NONE		NO	
09/10/88	528	1	148		NONE			200	TAKEOFF						NONE		NO	
09/10/88	565	1	883032		NONE			300	UNKNOWN						NONE		NO	
09/11/88	1241	1	88	15:45:00	NONE			200	TAKEOFF						NONE		ONE	
09/12/88	778	2	187	13:40:00	INV	POW LOSS		200	APPROACH						NONE		SEVERAL	
09/12/88	1019	1	1731		NONE			200	LANDING						NONE		SEVERAL	
09/12/88	1207	2	0		INV	POW LOSS		300	CLIMB						NONE			
09/14/88	779	2	230		NONE			200	UNKNOWN						ATB		FLOCK	

DATA SOURCES: ENGINE MANUFACTURER OR ICAO

EDATE	EVT#	ENG_POS	BIRD_NAM	BIRD_SPE	# BIRDS	WT_OZ_1	CTY_PKS	AIRPORT	LOCALE	US_INCID	ENGINE	DASH
08/13/88	1008	2					HJR-VNS	VNS	VARANASI, INDIA	NO	JT80	17
08/14/88	549	1	BUZZARD*		1		-FRA	XFO	GERMANY	NO	CFM56	3
08/14/88	773	1			1	32.	DUS-STR	STR	STUTTGART, GERMANY	NO	JT80	15
08/15/88	519	1			1		YZZ-YXD	XFO	CANADA	NO	JT80	9A
08/15/88	520	1	KILLDEER	5N33	1	3.	OMA-PHX	XUS	NEB-ARIZ	YES	JT80	15
08/15/88	521	2			*		-STL	XUS	ST LOUIS, MO	YES	CFM56	3
08/15/88	581	2					DAY-SDF	XUS	OHIO	YES	JT80	9A
08/15/88	774	2					-BOM	XFO	TAIWAN	NO	JT80	9A
08/15/88	1009	1			*			CLE	BOMBAY, INDIA	YES	JT80	78
08/16/88	521	2						MEL	MELBOURNE, AUSTRALIA	NO	CFM56	3
08/16/88	551	2			1		-CLT	XUS	NC	YES	CFM56	3
08/17/88	552	1			1		LHR-	XFO	LONDON, ENGLAND	NO	JT80	3
08/18/88	553	1			1			LVS	LYON, FRANCE	NO	CFM56	3
08/18/88	1298	2	UPLAND SANDPIPER	6N13	1	6.		LGM	HOUSTON, TEX	YES	JT80	9A
08/19/88	554	1			1		CCU-BBI	CCU	LONDON-GATWICK, ENGLAND	NO	CFM56	3
08/19/88	1010	2			1		DEL-PAT	PAT	CALCUTTA, INDIA	NO	JT80	17
08/19/88	1011	1			1			PNI	PATNA, INDIA	NO	JT80	17
08/20/88	1287	1	KITE*		1			RBA	PALMA, MALLORCA, SPAIN	NO	JT80	3
08/20/88	1294	2	AMERICAN KESTREL	5K26	1	3.5		TUL	RABAT, MOROCCO	YES	CFM56	17
08/21/88	555	1			1			XFO	TULSA, OKLA	NO	JT80	3
08/21/88	1012	2			1			IBZ	BARCELONA, INDIA	NO	JT80	3
08/21/88	1257	2	EURASIAN KESTREL	5K27	1	7.		RBA	IBIZA, SPAIN	NO	JT80	15
08/22/88	1295	1	EURASIAN KESTREL	5K27	1	8.	HAM-CGN	HAM	HAMBURG, GERMANY	NO	JT80	15
08/23/88	523	1	BLACK HEADED GULL	14N36	1	10.	HAN-CGN	HAM	HAMBURG, GERMANY	NO	JT80	9A
08/23/88	523	2	BLACK HEADED GULL	14N36	1	10.	HAN-CGN	HAM	HAMBURG, GERMANY	NO	JT80	15
08/24/88	1187	2	SPARROW*		3		COS-YNY	COS	RESISTENCIA, ARGENTINA	YES	CFM56	3
08/26/88	524	1			1		TFS-SPC	TFS	COLORADO SPRINGS, CO	NO	JT80	15
08/26/88	536	2			1		TFS-SPC	TFS	TENERIFE, CANARY ISLANDS	NO	CFM56	3
08/26/88	536	2			1		OKA-1SG	XFO	TENERIFE, CANARY ISLANDS	NO	JT80	17A
08/28/88	1013	2	COMMON STARLING	21Z75	2	3.	AMD-BDQ	AMD	JAPAN	YES	CFM56	3
08/29/88	557	1	COMMON STARLING	21Z75	1	3.	ATQ-SXR	XFO	INDIA	NO	JT80	9A
08/29/88	557	2			1		YTC-YXD	XFO	WIEN-SCHWECHAT, OSTERREICH	NO	JT80	9A
08/29/88	1014	2	SWALLOW*		1		PIT-BDL	XFO	CANADA	YES	CFM56	3
08/30/88	525	1			1			XFO	PA-NA	NO	JT80	9A
08/31/88	776	1	BARBARY PARTRIDGE	4L42	1	20.		XFO	TAIWAN	NO	JT80	7A
09/01/88	1186	2			1		LHR	LHR	INDONESIA	NO	JT80	9A
09/01/88	1255	2			*			LHR	LONDON, ENGLAND	NO	JT80	9A
09/01/88	1255	2	COMMON STARLING	21Z75	1	2.5		CND	LONDON, ENGLAND	NO	JT80	9A
09/01/88	1277	2	COMMON STARLING	21Z75	1	2.5		CND	CONSTANTA, ROMANIA	NO	JT80	9A
09/02/88	559	1			1		HRL-HOU	XUS	TEX	NO	JT80	9A
09/03/88	560	2			1		-BEG	XFO	BELGRADE, YUGOSLAVIA	YES	CFM56	3
09/03/88	583	1			1		-CLE	XUS	OHIO	YES	CFM56	3
09/04/88	526	2			1		YZZ-YAM	YAM	SAULT ST MARIE, CANADA	NO	JT80	9A
09/04/88	561	1	KITE*		1		-PIT	XUS	PA	YES	CFM56	3
09/04/88	1015	2			1			AND	AHMADABAD, INDIA	NO	JT80	15
09/05/88	562	1			1			ORJ	CHICAGO, ILL-CHARE	YES	CFM56	3
09/05/88	1017	1			*		IXV-URR	XFO	INDIA	NO	JT80	17
09/05/88	1311	1			*		AES	AES	AALESUND, NORWAY	NO	JT80	17
09/05/88	1311	2			*		RND	RND	AALESUND, NORWAY	NO	JT80	17
09/06/88	563	2			1		MMY-OKA	MMY	RENO, NEV	YES	CFM56	3
09/07/88	777	2			1			CBR	MIYAKO JIMA, JAPAN	NO	JT80	3
09/07/88	1226	1	GULL*		*			BFS	CANBERRA, AUSTRALIA	NO	CFM56	3
09/08/88	564	2			1		PAT-LKO	PAT	BELFAST, N. IRELAND	NO	CFM56	3
09/08/88	1018	1			1			IRO	PATNA, INDIA	NO	JT80	17A
09/08/88	1297	1	HADADA IBIS	6112	1	48.	CPT-PLZ	PLZ	KILIMANJARO, TANZANIA	NO	JT80	17A
09/09/88	528	1			1		-LGM	XFO	PORT ELIZABETH, S. AFRICA	NO	JT80	17A
09/10/88	565	1	COMMON GULL	14N13	1	15.		DEL	XIANEN, CHINA	NO	CFM56	3
09/11/88	1241	1	WHITE VULTURE	3K46	1	192.		TRV	EDINBURGH, SCOTLAND	NO	JT80	17A
09/12/88	1019	2			1			PHL	DEHLI, INDIA	NO	JT80	17A
09/12/88	1207	2			1		MMY-OKA	XFO	TRIVANDRUM, INDIA	YES	CFM56	3
09/14/88	779	2			1			XFO	PHILA, PA	NO	JT80	17

EV#	ENG_POS	DNG_CODE	SEVERITY	POM_LOSS	MAX_VIBE	THROTTLE	IFSD	REMARKS
1008	2	A,C,G	2	NONE			NO	2 F BLDs DAMAGED FOUND DURING GROUND INSPECTION
549	1		9				NO	
773	1		9				NO	
519	1		1					COOR IN COCKPIT
520	1	A,C,G	2				NO	FOUND DURING GROUND INSPECTION
350	2	A,D,I	3				NO	8 F BLDs REPLACED, 1 WITH .5 IN CRACK
581	2	A,C	3				NO	
774	2		9					
1009	1		9	COMPRESSOR			NO	5% EPR LOSS
521	2	A,B,H	3	NONE			YES	2 FAN BLADES REPLACED
551	2	A,D	3	NONE			NO	4 FAN BLDs REPLACED, FOUND ON GRD INSPEC
552	2		9		5.0	IDLE	NO	
353	2		9				NO	
1298	1		9					
522	1		9	NONE			NO	MOMENTARY INCREASE IN EGT
554	1	A	4	COMPRESSOR			NO	6 F BLDs UNK DAMAGE
1010	2		9				NO	
1287	2	A,Q	4	NONE			NO	ENG CHANGED COOR IN COCKPIT
1284	2		9				NO	
555	2		9					
1012	2		9				NO	COOR
1257	2	A,Q	4	NONE			NO	SOME ABRADABLE MISSING
1295	4	A,C	3				NO	
523	1		9					
523	3		9					
523	3		9					
1187	2		9	NONE			NO	
524	1	A,D	2	NONE			NO	
556	2		9	NONE			NO	
775	2		9					
1013	3	A,B,H	3	NONE		RETARD	NO	REPLACED 5 PAIRS OF FAN BLADES
557	2		9	NONE			NO	2 F BLDs CLEARED FROM RUNWAY
557	2		9				NO	FOUND ON GRD INSPEC
1014	2		9		SMALL			
1313	3	A,B	3	NONE			NO	1 F BLADE 1/4 INCH TIP CURL, GRD INSPEC
525	1		9				NO	INGESTED PIECE OF TIRE, ALSO FOUND BIRD
558	1	A,C	3				NO	3 FAN BLADES BLENDEN ON WING
1186	2	A,G	2					
1296	2		9					
1295	2		9					
1295	2		9					
1277	2		9	NONE			NO	150 BIRDS KILLED ON RUNWAY
559	2		9	NONE			NO	
560	2		9					
583	4	A	9	NONE			NO	
526	2		9	NONE			NO	
561	2		9				NO	
1015	2		9	NONE			NO	
562	1	A	4	NONE			NO	REPLACED 4 PAIRS OF FAN BLADES
1017	1		9				NO	FOUND ON GRD INSPEC
1311	1		9					
1311	2		9					
563	2		9	NONE			NO	
777	2		9					
1226	1		9					
1226	1	A,H	3	NONE			NO	LPC + HPC DAMAGE
564	2	A,I,K	3				NO	MANY F BLDs UNK DAMAGE
1018	1	A,Q	4				NO	
1263	1	A,D,H	2				NO	
527	1	A,C	3				NO	
528	1		9	NONE			NO	
565	1		9					
1241	1	A,Q	4				NO	ENG CHANGED
1019	2	A,D,G,K	1	YES	HIGH		EPR	PARAMETER DECAY, 1 1ST GVANE DISLODGED
1019	2		9				NO	
1207	2	A	4	SPOOL DOWN			NO	INVOLUNTARY EGT OVER TEMP LIGHT CAME ON, LOUD BANG
779	2		9					

DATA SOURCES: ENGINE MANUFACTURER OR ICAO

EDATE	EVT#	ENG_POS	MFG NO	ETIME	SIGN EVT	AIRCRAFT	POF	ALTITUDE	SPEED	FL RULES	LT CONDS	WEATHER	CREW AC	CREW AL	BIRD SEE
09/14/88	1016	2	1728		NONE	200	TAKEOFF	0					ATO		
09/14/88	1020	1	1732		NONE	200	UNKNOWN						CRASHED	YES	FLOCK
09/15/88	529	1	149	9:45:00	ENG-BIRDS	200	TAKEOFF	0 155	VFR	VFR	LIGHT	CLEAR	CRASHED	YES	FLOCK
09/15/88	529	2	149	9:45:00	ENG-BIRDS	200	TAKEOFF	0 155	VFR	VFR	LIGHT	CLEAR	CRASHED	YES	FLOCK
09/15/88	566	1	883033	18:50:00	MULT BIRDS	300	TAKEOFF	25 150				OVERCAST	ATB		SEVERAL
09/15/88	1021	1	1733	13:55:00	MULT BIRDS	200	TAKEOFF	0 122				CLOUDY	NONE	NO	NO
09/16/88	567	1	883034		NONE	300	CRUISE						NONE	NO	SEVERAL
09/16/88	1022	1	1734	8:45:00	NONE	200	TAKEOFF	0 120				CLOUDY	NONE	NO	SEVERAL
09/17/88	570	1	1754	13:00:00	NONE	200	TAKEOFF						ATB		ONE
09/17/88	760	2	188	8:17:00	NONE	200	CLIMB	1600 160				CLOUDY	ATB	NO	NO
09/18/88	568	1	883035		NONE	300	LANDING						NONE	NO	NO
09/18/88	1023	1	1735	8:15:00	NONE	200	TAKEOFF	0 80				CLOUDY	ATO	NO	FLOCK
09/19/88	781	1	216	13:14:00	MULT BIRDS	200	TAKEOFF	30 160	VFR	VFR		CLEAR	NONE	NO	FLOCK
09/19/88	781	2	216	13:14:00	MULT BIRDS	200	TAKEOFF	30 160	VFR	VFR		CLEAR	NONE	NO	FLOCK
09/20/88	530	1	145		NONE	300	UNKNOWN						NONE	NO	NO
09/20/88	530	1	883036		NONE	300	UNKNOWN						NONE	NO	ONE
09/20/88	782	1	217	1:25:00	NONE	200	TAXI	0 10				OVERCAST	NONE	NO	ONE
09/20/88	783	2	218	8:05:00	NONE	200	TAKEOFF	0 135				CLEAR	NONE	NO	ONE
09/20/88	784	2	230	16:24:00	NONE	200	TAKEOFF	0 80					NONE	NO	YES
09/20/88	1024	1	1736		NONE	200	UNKNOWN	0 71					ATO		
09/20/88	1025	1	1737		NONE	200	UNKNOWN						ATB		FLOCK
09/20/88	1026	1	1738		NONE	200	UNKNOWN						ATB		FLOCK
09/21/88	570	1	883037		MULT ENG	300	TAKEOFF	0 VR					ATB		NO
09/21/88	570	2	883038		MULT ENG	300	TAKEOFF	0 VR					ATB		NO
09/23/88	571	2	230		NONE	200	UNKNOWN						NONE	NO	FLOCK
09/23/88	785	2	230	14:06:00	MULT BIRDS	200	UNKNOWN					CLOUDY	ATB		NO
09/24/88	571	2	883039		NONE	300	TAKEOFF						NONE	NO	NO
09/24/88	580	1	883040		NONE	300	TAKEOFF						ATB		NO
09/25/88	572	1	1739		NONE	200	TAKEOFF	+V1					NONE	NO	YES
09/25/88	1027	1	1739		NONE	200	LANDING	0 140					NONE	NO	ONE
09/25/88	1028	1	1735	14:20:00	NONE	200	TAKEOFF	0 80				CLEAR	ATO		FLOCK
09/26/88	532	1	147	9:30:00	MULT BIRDS	200	TAKEOFF	100 150				BELOW CLOUDS	ATB		NO
09/26/88	573	1	883041		NONE	300	CLIMB						NONE	NO	NO
09/26/88	766	2	155	12:23:00	NONE	200	UNKNOWN						NONE	NO	NO
09/27/88	574	1	883042	16:30:00	NONE	200	UNKNOWN						NONE	NO	NO
09/27/88	767	1	158		NONE	200	LANDING						NONE	NO	NO
09/27/88	1028	1	1740		NONE	200	LANDING						NONE	NO	NO
09/28/88	768	1	1759	12:45:00	MULT BIRDS	200	TAKEOFF	0 100					ATO		ONE
09/28/88	1029	1	1741	7:27:00	NONE	200	LANDING	0 127					NONE	NO	FLOCK
09/28/88	1250	1	88	9:10:00	NONE	300	APPROACH	600 139				CLOUDY	NONE	NO	ONE
09/28/88	1271	1	88	9:30:00	NONE	200	TAKEOFF	0 145				OVERCAST	DIV		ONE
09/29/88	769	2	240	17:19:00	TRVS	100	TAKEOFF	0 140				CLEAR	NONE	NO	ONE
09/30/88	1231	1	88		NONE	300	UNKNOWN	0 140					NONE	NO	NO
09/30/88	575	1	883043		NONE	300	UNKNOWN						NONE	NO	NO
10/01/88	697	2	884001		NONE	300	UNKNOWN						NONE	NO	NO
10/02/88	698	2	884002		NONE	300	APPROACH						NONE	NO	NO
10/02/88	790	1	161		MULT	200	UNKNOWN						NONE	NO	ONE
10/02/88	790	2	161		MULT	200	UNKNOWN						NONE	NO	ONE
10/02/88	831	1	194	10:47:00	NONE	200	TAKEOFF	0 130				OVERCAST	NONE	NO	ONE
10/03/88	699	2	247		NONE	200	UNKNOWN						NONE	NO	NO
10/04/88	1030	1	884003	7:55:00	NONE	200	APPROACH	6500 250				CLOUDY	NONE	NO	ONE
10/04/88	1031	1	1742	20:06:00	NONE	200	TAKEOFF	10 130				OVERCAST	ATB	NO	ONE
10/05/88	832	1	1743		NONE	200	LANDING						NONE	NO	FLOCK
10/06/88	1032	1	248	8:35:00	MULT BIRDS	200	LANDING	10 140				CLEAR	NONE	NO	ONE
10/07/88	1033	1	1744		NONE	200	LANDING	0 70				OVERCAST	NONE	NO	ONE
10/08/88	1034	1	1745		NONE	200	TAKEOFF	0 VR					ATB		ONE
10/08/88	1035	1	1746		NONE	200	LANDING	0					NONE	NO	ONE
10/08/88	1035	2	1747		MULT	200	LANDING						NONE	NO	ONE
10/08/88	1211	1	88	7:05:00	NONE	200	TAKEOFF	5 130				CLEAR	ATB	NO	ONE
10/10/88	792	2	165		NONE	200	UNKNOWN						NONE	YES	FLOCK
10/12/88	793	2	163		NONE	200	APPROACH	0 130				CLOUDY	NONE	NO	NO
10/12/88	1290	1	88		MULT	100	UNKNOWN						NONE	NO	NO
10/13/88	1700	2	884004		NONE	300	LANDING	100 120				FOG	NONE	NO	NO
10/14/88	1276	1	88	10:25:00	NONE	200	LANDING						NONE	NO	NO

DATA SOURCES: ENGINE MANUFACTURER OR ICAO

DATE	EV#	ENG	POS	BIRD_NAM	BIRD_SPE	#_BIRDS	WT_OZ_1	CTY_PRS	AIRPORT	LOCALE	US_INCID	ENGINE	DASH
09/14/88	1016	2								AMDEB, INDIA	NO	JT8D	17
09/14/88	1020	1								INDIA	NO	JT8D	17A
09/15/88	529	1		SPECKLED PIGEON	2P4	8	11.5	BJR-ASM	BJR	BAHAR DAR, ETHIOPIA	NO	JT8D	17A
09/15/88	529	2		SPECKLED PIGEON	2P4	6	11.5	BJR-ASM	BJR	BAHAR DAR, ETHIOPIA	NO	JT8D	17A
09/15/88	566	1		LAPWING*		*				BELFAST, IRELAND	NO	CFM56	3
09/15/88	1021	1								VARANASI, INDIA	NO	JT8D	17
09/16/88	567	1								YUGOSLAVIA-SWITZERLAND	NO	CFM56	3
09/16/88	1022	1								HYDERABAD, INDIA	NO	JT8D	15
09/17/88	579	1								CHICAGO, ILL-MIDWAY	YES	JT8D	15
09/17/88	780	2								MADURAI, INDIA	NO	JT8D	17A
09/18/88	568	1		WOOD PIGEON		1	16.4	MAA-TRZ	MAA	LONDON-HEATHROW, ENGLAND	NO	CFM56	3
09/18/88	1023	1		KITE*	2P9	*				AURANGABAD, INDIA	NO	JT8D	9A
09/19/88	781	2								BUDAPEST, HUNGARY	NO	JT8D	15
09/20/88	530	1								CANADA	NO	JT8D	15
09/20/88	569	1		BARRED DOVE		1	2			GOTHENBURG, SWEDEN	YES	CFM56	3
09/20/88	782	1		GULL*	2P102	1	10			MILAN, ITALY	NO	JT8D	15
09/20/88	783	2		GULL*		1	10			ISHIGAKI, JAPAN	NO	JT8D	15
09/20/88	784	2		SWALLOW*		1				LUCKNOW, INDIA	NO	JT8D	17
09/20/88	1024	1								INDIA	NO	JT8D	15
09/20/88	1025	1								INDIA	NO	JT8D	15
09/21/88	570	1								LAS VEGAS, NEV	YES	CFM56	3
09/21/88	570	2				1				LAS VEGAS, NEV	YES	CFM56	3
09/23/88	531	2								CANADA	NO	JT8D	9A
09/23/88	785	2								JAPAN	NO	JT8D	17
09/23/88	1210	1		GALAH	1Q15	*	11.5	OXA-MMY	XFO	ADELAIDE, AUSTRALIA	NO	CFM56	3
09/24/88	571	2				1				MO-TEX	YES	CFM56	3
09/24/88	580	1								CHARLESTON, W. VA	YES	JT8D	9A
09/25/88	572	1		ROCK DOVE	2P1	1	14			LOS ANGELES, CA	YES	CFM56	3
09/25/88	1027	2								INDIA	NO	JT8D	9A
09/25/88	1185	2								KHARTOUM, SUDAN	NO	JT8D	17
09/25/88	1218	1								BANGALORE, INDIA	NO	JT8D	15
09/26/88	532	1		HERRING GULL	14N14	2	40	BRS-TCI	BRS	BRISTOL, ENGLAND	NO	CFM56	3
09/26/88	573	1		PARROT*		1				HELBORNE, AUSTRALIA	NO	JT8D	17
09/26/88	786	2		SPARROW*						JAPAN	NO	CFM56	3
09/27/88	574	1								PHOENIX, AZ	YES	CFM56	3
09/27/88	787	1		MOORING DOVE	2P105	*	4	JDH-JAT	JAT	JAIPUR, INDIA	YES	JT8D	9A
09/27/88	1028	2								BUENOS AIRES, ARGENTINA	NO	JT8D	9A
09/28/88	788	2								ALONG, INDIA	NO	JT8D	17
09/28/88	1029	2								HAGIB, BOUGIBA, TUNISIA	NO	CFM56	3
09/28/88	1250	2								BRISTOL, ENGLAND	NO	JT8D	17
09/28/88	1271	1		BLACK-BACKED GULL	14N17	1	29			SUDAN	NO	JT8D	17
09/29/88	789	2								PARIS, FRANCE	YES	CFM56	3
09/30/88	575	2		EURASIAN KESTREL	5K27	1	7			FRANKFURT, GERMANY	NO	CFM56	3
10/01/88	697	1				1				FRANKFURT, GERMANY	NO	CFM56	3
10/02/88	698	2				1				CANADA	NO	CFM56	3
10/02/88	790	1				*				CANADA	NO	JT8D	9A
10/02/88	790	2				*				QUEBEC, CANADA	NO	JT8D	9A
10/02/88	791	1				1				STUTTGART, GERMANY	NO	JT8D	15
10/02/88	831	1				1				PITTSBURGH, PA	YES	CFM56	3
10/03/88	699	2				1				JAMMU, INDIA	NO	JT8D	17
10/04/88	1030	1				1				BERGEN, NORWAY	NO	JT8D	17
10/04/88	1244	2		GULL*		1				LUCKNOW, INDIA	NO	JT8D	17
10/05/88	1031	1				2				VIENNA, AUSTRIA	NO	JT8D	15
10/06/88	832	2				1				VARANASI, INDIA	NO	JT8D	17
10/07/88	1032	1				1				AGRA, INDIA	NO	JT8D	9A
10/08/88	1033	1				1				INDIA	NO	JT8D	9A
10/08/88	1034	1								AGRA, INDIA	NO	JT8D	9A
10/08/88	1035	1								LUCKNOW, INDIA	NO	JT8D	9A
10/08/88	1035	2								INDIA	NO	JT8D	9A
10/08/88	1211	1		EAGLE*	2P105	1	4			AGRA, INDIA	NO	JT8D	9A
10/10/88	792	2		MOORING DOVE		*				DALLAS, TX	YES	JT8D	9A
10/12/88	793	2				*				VANCOUVER, CANADA	NO	JT8D	9A
10/12/88	1290	2				1	1.5			PORTLAND, ME	YES	JT8D	3
10/13/88	700	2		WHITE-THROATED SWIFT	1U71	1				PHOENIX, AZ	YES	CFM56	3
10/14/88	1276	1				1				LUTON, ENGLAND	NO	JT8D	3

DATA SOURCES: ENGINE MANUFACTURER OR ICAO

EDATE	EV#	ENG_POS	DNM_CODE	SEVERITY	POM_LOSS	MAX_VIBE	THROTTLE	IFSD	REMARKS
09/14/88	1016	2		9				NO	
09/14/88	1020	1	A,D,K,O	1	COMPRESSOR		ADVANCED	NO	CONTINUOUS SURGING, ERRATIC EPR
09/15/88	529	1	A,D,K,O	1	COMPRESSOR	5.0	ADVANCED	NO	CONTINUOUS SURGING, ERRATIC EPR
09/15/88	529	2	A,H	1	NONE		IDLE	NO	DOOR IN CABIN
09/15/88	566	1	A	3	NONE			NO	1ST F BLD'S UNK DAMAGE
09/15/88	1021	1	A,D	2	NONE			NO	8 PAIRS OF FAN BLADES REPLACED
09/16/88	567	1		9				NO	DOOR
09/16/88	1022	1		3				NO	DAMAGE TO C2 FAN BLADES, REPLACED C2 ASS
09/17/88	579	1	A,C	1				NO	FAN AND COMP BLD'S DAMAGED, ODOOR
09/17/88	780	2	A,D,G,K	9	NONE	SOME 2.8	IDLE	NO	
09/18/88	568	1		9	NONE			NO	1STG F BLD'S DAMAGED
09/18/88	1023	1	A,G	9	NONE			NO	SMALL BIRDS
09/19/88	781	2		9	NONE			NO	FOUND DURING GROUND INSPECTION
09/20/88	530	1		9		1.9		NO	
09/20/88	569	1		9	NONE			NO	
09/20/88	782	1		9	NONE			NO	
09/20/88	783	2		9	NONE			NO	
09/20/88	784	1		9				NO	
09/20/88	1024	1		9				NO	
09/20/88	1025	1		9				NO	FOUND ON GRD INSPEC
09/20/88	1026	1		9				NO	FOUND ON GRD INSPEC
09/21/88	570	1	A,H	3	NONE			NO	
09/21/88	570	2		9	NONE			NO	
09/21/88	571	2		9				NO	FOUND ON GRD INSPEC
09/21/88	785	1		9				NO	
09/23/88	1210	1	A,K	1				NO	UNK DAMAGE TO COMPRESSOR BLD'S
09/23/88	1211	2	A,K	9	NONE			NO	1 STG 4 HPC BLADE DAMAGED
09/24/88	571	2		1				NO	14 PAIRS OF FAN BLADES REPLACED
09/24/88	580	1	A	4	NONE			NO	
09/25/88	572	1		9				NO	3 F BLD'S DAMAGED
09/25/88	1027	2	A,G	2				NO	POWER LOSS, EPR SYMPTOM, EGT FAIL CODE
09/25/88	1185	1		9				NO	12 FAN BLADES SHINGLED
09/25/88	1218	1		9				NO	15 FAN BLADES DAMAGED, LE NICKS
09/26/88	573	1	A,D,H	2	COMPRESSOR	5.0	CUTOFF RETARD	YES	ENGINE REMOVED
09/26/88	573	3	A,H	9				NO	UNK # OF F BLD'S DAMAGED, DAM UNK
09/27/88	574	1	A,B	3	NONE			NO	HPC BLADES BEYOND MM LIMITS
09/27/88	787	1		9				NO	FOUND DURING GROUND INSPECTION
09/27/88	1028	2	A,G	9				NO	3 FAN BLADES DAMAGED
09/28/88	788	2		9				NO	FOUND ON GRD INSPEC
09/28/88	1029	2		9				NO	
09/28/88	1250	2	A,G	9				NO	
09/28/88	1251	2	A,Q	4				NO	
09/29/88	789	1	A,I	9				NO	
09/29/88	1231	2	A,C,K	1	NONE			NO	HPC BLADES BEYOND MM LIMITS
09/30/88	575	2		9	NONE			NO	FOUND DURING GROUND INSPECTION
10/01/88	698	1	A,H	3	NONE	4.0		NO	3 FAN BLADES DAMAGED
10/02/88	698	2		9				NO	FOUND ON GRD INSPEC
10/02/88	790	2		9				NO	FOUND ON GRD INSPEC
10/02/88	790	2		9				NO	FAN RUB STRIP GOUGED, 1+2 STG F BLD'S REP
10/02/88	791	1	A,G,K	1	NONE			NO	FOUND ON GRD INSPEC., 3 F BLD'S SHINGLED
10/02/88	831	1		9	NONE			NO	1 F BLD SHINGLED
10/03/88	699	2	A,H	3	NONE	YES		NO	
10/04/88	1030	1	A,H	9				NO	
10/04/88	1244	2		9				NO	
10/05/88	1031	2		9	NONE			NO	
10/06/88	832	2		9				NO	
10/07/88	1032	1		9				NO	
10/08/88	1033	1		9				NO	
10/08/88	1034	1		9				NO	
10/08/88	1035	1		9				NO	
10/08/88	1035	2		9				NO	
10/08/88	1211	1		9				NO	
10/08/88	792	1		9				NO	
10/10/88	793	2		9				NO	
10/12/88	1240	4	A,Q	9	NONE			NO	FOUND ON GRD INSPEC.
10/13/88	700	9		9				NO	
10/14/88	1276	1		9				NO	

DATA SOURCES: ENGINE MANUFACTURER OR ICAO

EDATE	EV#	ENG POS	MFG NO	ETIME	SIGN EVT	AIRCRAFT	POF	ALTITUDE	SPEED	FL RULES	LT CONDS	WEATHER	CREW AC	CREW AL	BIRD SEE
10/15/88	1036	1	1748	16:57:00	NONE	200	LANDING	0	120			CLOUDY	NONE	NO	SEVERAL
10/17/88	701	2	884005		NONE	300	TAKEOFF						NONE	NO	NO
10/18/88	1240	2	88		NONE	300	APPROACH					CLOUDY	NONE	NO	
10/19/88	164	2	164		NONE	200	LANDING						NONE	NO	
10/20/88	1183	2	1828	14:40:00	NONE	200	APPROACH					CLOUDY	NONE	NO	SEVERAL
10/20/88	1184	2	1612	7:50:00	MULT BIRDS	200	TAKEOFF	0	120			CLOUDY	NONE	NO	YES
10/21/88	795	1	167	21:00:00	NONE	200	LANDING	25	80			RAIN	NONE	NO	SEVERAL
10/22/88	1037	1	1749	20:25:00	NONE	200	TAKEOFF	0	80			CLEAR	NONE	NO	SEVERAL
10/23/88	833	1	237	19:27:00	MULT BIRDS	200	TAKEOFF	0	80			CLEAR	ATO	YES	
10/23/88	1182	1	1538		NONE	200	LANDING					BROKEN	NONE		
10/24/88	798	1	250	15:45:00	NONE	200	UNKNOWN					OVERCAST	NONE	NO	NO
10/26/88	1209	2	0	8:00:00	NONE	200	TAKEOFF	0	130			OVERCAST	NONE	NO	NO
10/26/88	703	1	884007		NONE	300	UNKNOWN						NONE	NO	NO
10/26/88	704	2	884008		NONE	300	TAKEOFF	0	VR			OVERCAST	NONE	NO	FLOCK
10/26/88	1216	2	88	9:00:00	NONE	300	LANDING	200	130			OVERCAST	NONE	NO	
10/28/88	799	1	250	12:53:00	MULT BIRDS	200	LANDING	0	110			BROKEN	NONE	NO	ONE
10/28/88	1038	2	1750	10:30:00	NONE	200	LANDING	0	130			CLOUDY	NONE	NO	FLOCK
10/29/88	1236	1	88	9:19:00	NONE	200	TAKEOFF	200	160			CLEAR	NONE	NO	YES
10/31/88	800	2	169	21:35:00	NONE	200	CLIMB	500	150			CLEAR	ATB	NO	SEVERAL
11/02/88	801	2	176	7:50:00	MULT BIRDS	200	TAKEOFF	0	146			OVERCAST	NONE	NO	NO
11/03/88	705	2	884009	20:00:00	NONE	300	TAKEOFF	200	140				NONE	NO	
11/03/88	1039	2	1751		NONE	200	TAKEOFF	50	130				NONE		
11/04/88	802	1	250		NONE	200	UNKNOWN						ATB	YES	ONE
11/05/88	803	1	171	6:30:00	NONE	200	TAKEOFF	5	150	VFR		CLOUDY	ATO	NO	NO
11/07/88	706	1	884010	7:40:00	INV POW LOSS	300	TAKEOFF	0	+V1				ATB	NO	SEVERAL
11/07/88	804	2	884011		NONE	200	TAKEOFF	15	133			CLOUDY	ATB	NO	
11/07/88	834	2	172	9:15:00	MULT BIRDS	200	TAKEOFF								
11/07/88	805	1	270		NONE	200	TAKEOFF								
11/09/88	806	1	174	17:30:00	NONE	200	TAKEOFF								
11/09/88	806	1	173	13:30:00	ATMUTHY	200	CLIMB	2000	0	VFR		CLEAR	ATB	NO	ONE
11/09/88	1305	1	88	14:03:00	MULT ENG-BIRDS	200	TAKEOFF	0	137			OVERCAST	NONE	NO	NO
11/09/88	1305	2	88	14:03:00	MULT ENG-BIRDS	200	TAKEOFF	0	137			OVERCAST	NONE	NO	ONE
11/10/88	1258	1	88	21:55:00	NONE	200	CLIMB		125			CLEAR	NONE	NO	
11/12/88	807	1	179		NONE	200	TAKEOFF								
11/13/88	835	2	270		NONE	200	CLIMB								
11/14/88	708	1	884012	18:45:00	NONE	300	APPROACH					CLOUDY	NONE	NO	NO
11/14/88	1237	1	88	13:44:00	MULT BIRDS	200	LANDING	5	135			CLOUDY	NONE	NO	FLOCK
11/14/88	1278	1	88	6:00:00	NONE	200	TAKEOFF	0	140			CLEAR	NONE	NO	
11/15/88	1238	1	88	16:15:00	NONE	200	APPROACH								
11/16/88	808	1	175	11:00:00	NONE	300	UNKNOWN								
11/16/88	1296	2	88	7:31:00	NONE	200	LANDING	50	120			RAIN	NONE	NO	FLOCK
11/17/88	809	2	178		NONE	200	UNKNOWN								
11/17/88	1040	1	1752		NONE	200	LANDING								
11/17/88	1279	1	88	13:49:00	NONE	200	TAKEOFF	0				CLOUDY	NONE	NO	ONE
11/18/88	836	2	112		NONE	200	UNKNOWN								
11/18/88	837	2	249	7:43:00	MULT BIRDS	200	LANDING	0	130			FOG	NONE	NO	FLOCK
11/19/88	810	1	177	17:00:00	INV POW LOSS	200	TAKEOFF	200					ATB	NO	FLOCK
11/19/88	1041	1	1753		NONE	200	LANDING	0	VT				NONE	NO	FLOCK
11/19/88	1300	2	88	16:20:00	MULT BIRDS	300	LANDING	0	130			OVERCAST	NONE	NO	ONE
11/20/88	838	2	252	18:45:00	NONE	200	TAKEOFF	0	80			CLOUDY	ATO	NO	NO
11/21/88	709	1	884013		NONE	300	LANDING						NONE	NO	NO
11/22/88	710	2	884014		NONE	300	UNKNOWN						NONE	NO	NO
11/23/88	811	2	884015		MULT BIRDS	200	TAKEOFF						NONE	NO	NO
11/23/88	811	2	185		INV POW LOSS	300	TAKEOFF	0					ATO	NO	YES
11/24/88	712	1	884016		MULT BIRDS	300	CRUISE	4000					NONE	NO	FLOCK
11/24/88	1042	1	1754		NONE	200	TAKEOFF						ATO	NO	
11/24/88	1205	2	0		NONE	200	UNKNOWN						NONE	NO	NO
11/26/88	813	1	191	21:40:00	NONE	200	LANDING	0	120			RAIN	NONE	NO	NO
11/27/88	813	2	189	8:47:00	NONE	200	LANDING	0	128			BELOW CLOUDS	OTHER	NO	NO
11/29/88	839	1	251	11:35:00	NONE	200	LANDING					RAIN	NONE	NO	ONE
11/30/88	713	2	884017		NONE	300	UNKNOWN						NONE	NO	NO
12/01/88	814	1	186	7:45:00	MULT BIRDS	200	TAKEOFF	50	160	IFR		RAIN	ATB	NO	FLOCK
12/04/88	714	1	884018	9:00:00	NONE	300	CLIMB	0	123			CLOUDY	ATO	NO	SEVERAL
12/05/88	815	1	270		NONE	200	TAKEOFF						NONE	NO	
12/05/88	840	2	270		NONE	200	UNKNOWN						NONE	NO	
12/05/88	841	2	162	20:25:00	NONE	200	LANDING	200	130			CLEAR	NONE	NO	SEVERAL
12/05/88	1318	1	88	9:41:00	NONE	200	TAKEOFF	0	140			CLOUDY	ATB	NO	

DATA SOURCES: ENGINE MANUFACTURER OR ICAO

EDATE	EVT#	ENG POS	BIRD NAM	BIRD SPE	# BIRDS	WT OZ	1	CTY	PRS	AIRPORT	LOCALE	US INCID	ENGINE	DASH
10/15/88	1036	1	COMMON SONG THRUST	412282	1	2.6		IDR-BHO	BHO	BHO	BHOPAL, INDIA	NO	JT8D	9A
10/17/88	1240	2						CLT	CLT	CLT	PARIS-ONLY FRANCE	NO	CFM56	3
10/18/88	1240	2	SNOW GOOSE	2J26	1	86.	YZF-YHY	TUC	TUC	TUC	CHARLOTTE, NC	YES	JT8D	9A
10/19/88	1183	2						SFN	SFN	SFN	HAY RIVER, CANADA	NO	JT8D	9A
10/20/88	1184	2						DUR-SBP	DUR	DUR	TUCUMAN, ARGENTINA	NO	JT8D	9A
10/21/88	795	1	GULL*		*	20.	DEL-AND	AND	AND	AND	SANTA FE, ARGENTINA	NO	JT8D	9A
10/22/88	1037	1						SLL-MCT	SLL	SLL	DURBAN, S. AFRICA	NO	JT8D	9A
10/23/88	833	1	STONE CURLEW	9N1	*	16.	DEL-AND	AND	AND	AND	AMHEDABAD, INDIA	NO	JT8D	9A
10/23/88	1182	1	HORNED LARK	17274	*	1.5	SLL-MCT	SLL	SLL	SLL	SAHALAN, OMAN	YES	JT8D	15
10/24/88	1209	2						XFO	XFO	XFO	JAPAN	NO	JT8D	17
10/26/88	702	2						CWB-GRU	CWB	CWB	CURITIBA, BRAZIL	NO	CFM56	3
10/26/88	702	2						DEF-XUS	XUS	XUS	DALLAS/Ft WORTH, TX	YES	CFM56	3
10/26/88	703	2						OKC-SLC	OKC	OKC	OKLAHOMA CITY, OK	YES	CFM56	3
10/26/88	704	2	SPARROW*		*			ATT	ATT	ATT	ANTALYA, TURKEY	NO	CFM56	3
10/28/88	1216	2						XFO	XFO	XFO	JAPAN	NO	JT8D	17
10/28/88	799	1						MAA-BLR	BLR	BLR	BANGALORE, INDIA	NO	JT8D	9A
10/28/88	1038	2	KITE*					NCE	NCE	NCE	NICE, FRANCE	NO	JT8D	17
10/29/88	1236	1	GULL*					PNA-DEL	PNA	PNA	PATNA, INDIA	NO	JT8D	15
10/31/88	800	2	BLACK PARTRIDGE	4L44	*	14.	EMA-ACE	PVH	PVH	PVH	EAST MIDLANDS, ENGLAND	NO	JT8D	3
11/02/88	801	2						HYD	HYD	HYD	PORTO VELHO, BRAZIL	NO	CFM56	3
11/03/88	705	2						XFO	XFO	XFO	HYDERABAD, INDIA	NO	JT8D	9A
11/03/88	1039	1						XFO	XFO	XFO	TAIWAN	NO	JT8D	9A
11/04/88	802	1						BHM	BHM	BHM	BIRMINGHAM, AL	YES	JT8D	7
11/05/88	803	1	HAWK*					AMS	AMS	AMS	MIDLAND/ODESSA, TX	YES	CFM56	3
11/07/88	706	1	COMMON LAPWING	5N1	1	7.6		YOM-YYZ	YOM	YOM	OTTAWA, CANADA	NO	JT8D	9A
11/07/88	804	2	BROWN-HOODED GULL	14N35	*	10.1	MDQ-BUE	MDQ	MDQ	MDQ	AMSTERDAM, NETHERLANDS	NO	CFM56	3
11/07/88	804	2						SRQ-TPA	SRQ	SRQ	MINDIPTANA, INDONESIA	YES	JT8D	9A
11/07/88	834	1						BEN	BEN	BEN	SARASOTA, FL	NO	JT8D	7B
11/09/88	805	1	BLACK KITE	3K28	*	28.	BEN-JNB	EGNV	EGNV	EGNV	BLUMFONTEIN, S. AFRICA	NO	JT8D	17A
11/09/88	806	1	LAPWING*					JAI	JAI	JAI	TEES-SIDE, ENGLAND	NO	JT8D	9A
11/09/88	1305	2	LAPWING*					YOM-YYZ	YOM	YOM	JAIPUR, INDIA	NO	JT8D	9A
11/10/88	1258	1						-LGM	LGM	LGM	OTTAWA, CANADA	NO	JT8D	9A
11/12/88	807	1						MCI-DEN	DEN	DEN	BANIA BLANCA, ARGENTINA	NO	CFM56	3
11/13/88	835	2						DAY-ORD	ORD	ORD	LONDON-GATWICK, ENGLAND	NO	JT8D	9A
11/14/88	708	1	PIGEON*					MAA-BLR	BLR	BLR	NICE, FRANCE	NO	JT8D	9A
11/14/88	1237	1						MAA	MAA	MAA	MADRAS, INDIA	NO	JT8D	9A
11/14/88	1278	1						NCE	NCE	NCE	NICE, FRANCE	NO	JT8D	9A
11/15/88	1238	1						MCI-DEN	DEN	DEN	MO-CO	NO	CFM56	3
11/16/88	808	1	GULL*					DAY-ORD	ORD	ORD	SALZBURG, AUSTRIA	YES	CFM56	3
11/16/88	1296	2						MAA-BLR	BLR	BLR	OH-IL	NO	JT8D	7B
11/17/88	809	2						CGN-HAM	HAM	HAM	BANGALORE, INDIA	NO	JT8D	17
11/17/88	1040	1						PDX-SFO	SFO	SFO	MALAGA, SPAIN	NO	JT8D	15
11/17/88	1279	1						IXV-UDR	UDR	UDR	HAMBURG, GERMANY	NO	JT8D	15
11/18/88	836	2	GULL*					AMS	AMS	AMS	PORTLAND, OR	YES	JT8D	15
11/18/88	837	2	AMERICAN WIGEON	2J71	1	28.		GRZ	GRZ	GRZ	UDAIPUR, INDIA	NO	JT8D	9A
11/19/88	810	1						CWB	CWB	CWB	AMSTERDAM, NETHERLANDS	NO	CFM56	3
11/19/88	1041	1						XFO	XFO	XFO	GRAZ, AUSTRIA	NO	JT8D	15
11/20/88	1300	2	GULL*	2S102	1	5.3		BHZ-MIN	BHZ	BHZ	CURITIBA, BRAZIL	NO	CFM56	3
11/20/88	838	2	BURROWING OWL					-LHR	LHR	LHR	TAMPA/ST PETERSBURG, FL	YES	CFM56	3
11/21/88	709	1						CMB-TRZ	CMB	CMB	BELO HORIZONTE, BRAZIL	NO	CFM56	3
11/22/88	710	2	STARLING*					CPT-PLZ	PLZ	PLZ	LONDON-HEATHROW, ENGLAND	NO	JT8D	17A
11/23/88	711	2	STARLING*					DUR-ELS	ELS	ELS	COLOMBO, SRI LANKA	YES	CFM56	3
11/23/88	811	1						6112			PORT ELIZABETH, S. AFRICA	NO	JT8D	17A
11/24/88	712	1	OWL*					14N36			EAST LONDON, S. AFRICA	NO	JT8D	17A
11/24/88	1042	1	HADADA IBIS					14N36			MALTA, MEDITERRANEAN SEA	NO	CFM56	3
11/24/88	1205	2						9.7	AMS-ENS	ENS	BRUSSELS, BELGIUM	NO	JT8D	15A
11/26/88	812	1	BLACK-HEADED GULL					10.			LAUNCESTON, AUSTRALIA	NO	CFM56	3
11/26/88	813	2	BLACK-HEADED GULL								BANIA BLANCA, ARGENTINA	NO	JT8D	9A
11/29/88	839	2	BLACK-HEADED GULL								ARGENTINA	NO	JT8D	9A
11/30/88	713	2	BLACK-HEADED GULL								TOKYO-HANEDA, JAPAN	NO	JT8D	9A
12/01/88	814	1	BLACK-HEADED GULL								BANIA BLANCA, ARGENTINA	NO	JT8D	9A
12/04/88	714	1	BLACK-HEADED GULL									NO	JT8D	9A
12/05/88	815	1	BLACK-HEADED GULL									NO	JT8D	9A
12/05/88	840	2	BLACK-HEADED GULL									NO	JT8D	9A
12/05/88	841	2	BLACK-HEADED GULL									NO	JT8D	9A
12/05/88	841	2	BLACK-HEADED GULL									NO	JT8D	9A
12/05/88	1318	1	BROWN-HOODED GULL	14N35	1	10.1						NO	JT8D	9A

DATA SOURCES: ENGINE MANUFACTURER OR ICAO

EDATE	EVT#	ENG POS	DNG CODE	SEVERITY	POW LOSS	MAX VIBE	THROTTLE	IFSD	REMARKS
10/15/88	1036	1		9	NONE			NO	
10/17/88	701	2		9				NO	
10/18/88	1240	4	A,Q	9					1 F BLD BENT
10/19/88	794	3	A,C	9					1 STG FAN ASSEMBLY CHANGED
10/20/88	1183	2	A,D	2					10 OTHER FBIDS SEVERE DAM, DAM THRU COMP FOUND ON GRD INSPEC
10/21/88	795	1	A,I,K	1	COMPRESSOR HIGH				BENT F BIDS REPLACED FAN ASSEMBLY
10/22/88	1037	1		9	NONE				5 F BIDS SHINGLED
10/23/88	833	1		9					'LOUD VIBRATING SOUND' FROM ENGINE
10/23/88	1182	1		9					
10/24/88	798	1	A,D	3					
10/24/88	1209	2	A,H	2					
10/26/88	702	2		3					
10/26/88	703	2	A,D	9					
10/26/88	704	2		9					
10/26/88	1216	2		9					
10/28/88	799	1		9					
10/28/88	1038	2		9					
10/29/88	1236	1	A,D,G	9					ENGINE CHANGE, 1STG F BIDS REPLACED
10/31/88	800	2	A,D,H,M	2					ENG REMOVED, ENG SURGED TWICE ON POW RED
11/02/88	801	2	A,C	2	COMPRESSOR		IDLE	VOLUNTARY YES	
11/03/88	705	2		3	NONE			NO	
11/03/88	1039	1	A,C	3	COMPRESSOR				1 F BLD CHANGED
11/04/88	802	1		3					LOUD BANG AT LIFTOFF
11/05/88	803	1	A,D,H	1					3 FAN OGV'S DAMAGED
11/07/88	706	1	A,D,H	2					7 F BIDS WITH TRAILING EDGE TIP CURL
11/07/88	804	2	A,I,K	2	NONE	HIGH			SEVERE GAS PATH DAMAGE
11/07/88	834	1		1	COMPRESSOR				
11/09/88	805	1	A,E,G,K	9	COMPRESSOR				AC SWUNG TO LEFT, DAMAGE THRU GAS PATH
11/09/88	806	1		9					
11/09/88	1305	1		9					
11/09/88	1305	2	A,Q	4					
11/10/88	1258	1		9					ODOR IN CABIN
11/12/88	807	1	A,C,K	4	NONE				SMALL DAM IN 13TH STG COMP
11/13/88	835	1		9	NONE				
11/14/88	708	1		9					
11/14/88	1237	1		9					
11/14/88	1278	1		9					
11/15/88	1238	1	A,G	9					FOUND ON GRD INSPEC, C1+C2 DAMAGE
11/16/88	808	1		2					
11/16/88	1296	2	A,D	2					FOUND ON GRDINSPEC,C1 DISK+BLDS REPLACED
11/17/88	809	2		9					
11/17/88	1040	1		9					LPC DAMAGE
11/17/88	1279	1	A,H,K,M	9	NONE				
11/18/88	836	2	A,B,G,K	9	SPOOL DOWN				INVOLUNTARY 3X5IN LE PIECE LIBERATED
11/18/88	837	2		9					
11/19/88	810	1		9					
11/19/88	1041	1		9					
11/19/88	1300	2	A,B,C	9					FOUND ON SHOP INSPEC. FOR OTHER REASON
11/20/88	838	2	A,I	9					TRVS FRAC .75IN ABOVE MIDSPAN SHROUD
11/21/88	709	1		9					N1 ENG CORE INLET PARTIALLY BLOCKED
11/22/88	710	1		9					CHANGED FAN DUE TO BENT BLDS # UNK
11/23/88	711	2		3	1.3 HIGH				FAN CHANGE, ING WHILE IN REVERSE THRUST
11/23/88	811	1		9					
11/24/88	712	1	A,D	1					FOUND ON GRD INSPEC
11/24/88	1042	1	A,D	9					ONE F BLD TRVS FRAC 100% LOSS OF THRUST
11/24/88	1205	2	A,D	2					ACUSTIC LINING AT REAR OF FBIDS MISSING
11/26/88	812	1	A,D	9					EPR SYMPTOM
11/26/88	813	1	A,D	2					4 F BIDS BENT
11/27/88	815	2		9					
11/29/88	839	1	A,H,I,M	9					
11/30/88	713	2	A,C,H	9	COMPRESSOR HIGH		CUTOFF	VOLUNTARY VIBE	
12/01/88	814	1	A,D	1					
12/04/88	714	1		3					
12/05/88	815	1	A,D	2					
12/05/88	840	1		9					
12/05/88	841	2		9					
12/05/88	1318	1	A,Q	4					

DATE	EVT#	ENG_POS	MFG_NO	ETIME	SIGN_EVT	AIRCRAFT	POF	ALTITUDE	SPEED	FL_RULES	LT_CONDS	WEATHER	CREW_AC	CREW_AL	BIRD_SEE
12/07/88	715	2	884019	11:00:00	NONE	300	TAKEOFF	0	VR		BRIGHT	CLEAR	ATB	NO	ONE
12/07/88	716	1	884020		NONE	300	APPROACH						NONE	NO	FLOCK
12/07/88	717	2	884021		MULT ENG-BIRDS	300	APPROACH						NONE	NO	FLOCK
12/07/88	718	1	884022	11:46:00	MULT ENG-BIRDS	300	LANDING	0	100			OVERCAST	NONE	NO	FLOCK
12/07/88	719	2	884023	16:46:00	MULT ENG-BIRDS	300	LANDING	0	100			OVERCAST	NONE	NO	FLOCK
12/07/88	720	1	884024		NONE	300	TAKEOFF	0	130			CLOUDY	NONE	NO	FLOCK
12/07/88	721	1	884025	8:36:00	NONE	300	TAKEOFF	0	130			CLEAR	NONE	NO	NO
12/11/88	717	1	884026	9:20:00	MULT ENG	300	CLIMB	50	125			CLEAR	NONE	NO	YES
12/11/88	718	2	884027	9:20:00	MULT ENG	300	CLIMB	50	125			BELOW CLOUDS	NONE	NO	YES
12/11/88	719	2	884028	18:15:00	MULT BIRDS	300	TAKEOFF					RAIN	ATB	NO	FLOCK
12/12/88	842	2	884029	10:22:00	MULT BIRDS	300	UNKNOWN						NONE	NO	
12/13/88	813	2	884030		NONE	300	UNKNOWN						NONE	NO	
12/13/88	814	2	884031		NONE	300	UNKNOWN						NONE	NO	
12/14/88	817	1	884032		NONE	300	UNKNOWN						NONE	NO	
12/14/88	818	2	884033	16:40:00	MULT BIRDS	300	TAKEOFF	0	125			CLEAR	NONE	NO	FLOCK
12/15/88	719	2	884034	15:00:00	MULT BIRDS	300	TAKEOFF	0	130			RAIN	NONE	NO	ONE
12/18/88	818	2	884035	7:45:00	NONE	300	CLIMB	1500				CLEAR	NONE	NO	SEVERAL
12/19/88	819	2	884036	17:47:00	NONE	300	TAKEOFF	0	133			RAIN	ATB	YES	ONE
12/20/88	820	2	884037	10:30:00	NONE	300	CLIMB					CLEAR	NONE	NO	NO
12/20/88	844	2	884038	12:20:00	NONE	300	LANDING	100	130			CLEAR	NONE	NO	FLOCK
12/20/88	1301	2	884039	15:13:00	MULT ENG-BIRDS	300	LANDING	10	120			OVERCAST	NONE	NO	FLOCK
12/20/88	1301	2	884040	15:13:00	MULT ENG-BIRDS	300	LANDING	10	120			OVERCAST	NONE	NO	FLOCK
12/21/88	821	2	884041	7:00:00	MULT ENG-BIRDS	300	TAKEOFF	20	145			CLEAR	NONE	NO	FLOCK
12/21/88	822	2	884042	7:00:00	MULT ENG-BIRDS	300	TAKEOFF	20	145			CLEAR	NONE	NO	FLOCK
12/21/88	823	2	884043	7:00:00	MULT ENG-BIRDS	300	UNKNOWN						NONE	NO	ONE
12/22/88	721	2	884044	8:00:00	NONE	300	LANDING	0	124			OVERCAST	NONE	YES	FLOCK
12/22/88	722	2	884045	16:25:00	MULT BIRDS	300	LANDING	30	124				NONE	NO	FLOCK
12/23/88	797	2	884046		NONE	300	UNKNOWN						NONE	NO	ONE
12/25/88	722	2	884047	8:45:00	NONE	300	LANDING				BRIGHT	CLEAR	NONE	NO	FLOCK
12/25/88	723	2	884048		NONE	300	TAKEOFF						NONE	NO	FLOCK
12/25/88	823	2	884049		NONE	300	UNKNOWN						NONE	NO	ONE
12/28/88	724	2	884050	17:36:00	NONE	300	TAKEOFF	0	140			OVERCAST	NONE	NO	NO
12/31/88	729	2	884051		MULT BIRDS	300	APPROACH	3600	210			OVERCAST	ATB	NO	ONE
12/31/88	729	2	884052		NONE	300	TAKEOFF	0	VR			OVERCAST	NONE	YES	FLOCK
01/01/89	1359	1	884053	8:34:00	NONE	200	TAKEOFF	0	VR			CLEAR	ATB	NO	NO
01/01/89	825	1	884054	10:15:00	NONE	100	LANDING	5	130			CLEAR	OTHER	NO	ONE
01/03/89	825	1	884055		NONE	200	UNKNOWN							NO	
01/06/89	826	1	884056		NONE	200	LANDING	0	60			CLEAR	ATO	NO	FLOCK
01/08/89	827	1	884057	19:38:00	NONE	200	TAKEOFF	0	VR			OVERCAST, DRY	DIV	NO	FLOCK
01/11/89	863	2	884058	12:42:00	MULT ENG-BIRDS	300	TAKEOFF	0	VR			OVERCAST, DRY	DIV	NO	SEVERAL
01/11/89	863	2	884059	12:42:00	MULT ENG-BIRDS	300	TAKEOFF	0	VR			OVERCAST, DRY	DIV	NO	SEVERAL
01/11/89	1349	2	884060	10:30:00	NONE	300	LANDING	100	120			OVERCAST	OTHER	NO	FLOCK
01/12/89	1350	2	884061	18:20:00	MULT BIRDS	100	LANDING	0	125			OVERCAST	OTHER	NO	SEVERAL
01/13/89	864	2	884062	12:30:00	NONE	300	APPROACH	0				RAIN	NONE	NO	SEVERAL
01/14/89	1424	1	884063	19:13:00	NONE	200	LANDING	0	120			SOME CLOUDS	NONE	NO	SEVERAL
01/16/89	865	1	884064		NONE	300	UNKNOWN						NONE	NO	
01/17/89	1342	2	884065		NONE	300	APPROACH						NONE	NO	
01/17/89	828	2	884066		MULT BIRDS	200	TAKEOFF	0	50				ATB	YES	YES
01/19/89	829	2	884067		NONE	200	TAKEOFF	0	50				ATB	YES	YES
01/19/89	1203	2	884068		NONE	300	TAKEOFF	100	140			FOG	NONE	NO	YES
01/20/89	866	2	884069		NONE	300	LANDING	0					NONE	NO	YES
01/20/89	1337	2	884070		NONE	200	CLIMB	1000					OTHER	NO	NO
01/22/89	845	2	884071	16:00:00	NONE	200	TAKEOFF	0	100			CLEAR	ATO	YES	YES
01/23/89	1045	2	884072	10:30:00	NONE	200	TAKEOFF	0	100			CLEAR	NONE	YES	SEVERAL
01/23/89	1045	2	884073	10:30:00	NONE	200	LANDING	0	100			OVERCAST	NONE	YES	SEVERAL
01/23/89	1410	2	884074	10:00:00	NONE	100	CLIMB	0	160			OVERCAST	ATB	NO	NO
01/26/89	1334	1	884075	19:20:00	NONE	300	LANDING	1000	100			OVERCAST	NONE	NO	NO
01/27/89	846	2	884076		NONE	300	UNKNOWN					CLOUDY	NONE	NO	
01/27/89	867	2	884077		NONE	300	UNKNOWN						NONE	NO	
01/27/89	868	2	884078		NONE	300	TAXI	0	0				NONE	ONE	SEVERAL
01/29/89	869	2	884079		MULT BIRDS	300	TAKEOFF	0	130			CLEAR	ATO	NO	SEVERAL
01/29/89	870	2	884080		NONE	300	TAKEOFF	0	130			CLEAR	NONE	NO	SEVERAL
01/29/89	1204	2	884081		NONE	300	LANDING	0					NONE	ONE	SEVERAL
01/30/89	1411	2	884082		NONE	300	TAKEOFF	0					NONE	ONE	SEVERAL
02/01/89	847	2	884083	17:37:00	MULT BIRDS	200	TAKEOFF	50	140			SOME CLOUDS	NONE	ONE	ONE

EDATE	EVT#	ENG_POS	BIRD_NAM	BIRD_SPE	# BIRDS	WT_OZ	1	CTY_PRS	AIRPORT	LOCALE	US_INCID	ENGINE	DASH
12/07/88	715	2			1			GSP	GREENVILLE, SC		YES	CFM56	3
12/07/88	716	1			1			FRA	FRANKFURT, GERMANY		NO	CFM56	3
12/07/88	716	2			*			FRA	FRANKFURT, GERMANY		NO	CFM56	3
12/07/88	1239	1			*			DUS	DUSSELDORF, GERMANY		NO	CFM56	3
12/07/88	1239	2			*			DUS	DUSSELDORF, GERMANY		NO	CFM56	3
12/10/88	1283	1			1			BOD	BORDEAUX, FRANCE		NO	JT8D	3
12/11/88	717	1			1			DUS-TFS	DUSSELDORF, GERMANY		NO	JT8D	3
12/11/88	718	2			1			-ANS	AMSTERDAM, NETHERLANDS		NO	CFM56	3
12/11/88	842	2			1			XFO	BAHIA BLANCA, ARGENTINA		NO	CFM56	3
12/11/88	842	2			1			BHI	BAHIA BLANCA, ARGENTINA		NO	JT8D	9A
12/11/88	842	2			1			BHI	BAHIA BLANCA, ARGENTINA		NO	JT8D	9A
12/12/88	843	2			*			TTJ	TOTOTRI, JAPAN		NO	JT8D	15A
12/12/88	843	2			*			AKL	AUKLAND, NEW ZEALAND		NO	JT8D	15A
12/13/88	816	2			*			-GOI	INDIA		NO	JT8D	17
12/14/88	817	1			*			XFO	ARGENTINA		NO	JT8D	9A
12/14/88	1242	1			*			ELP	EL PASO, TX		YES	JT8D	3
12/15/88	719	2			1			AMS-FCO	AMSTERDAM, NETHERLANDS		NO	CFM56	3
12/18/88	818	2			2			AMS-FCO	AMSTERDAM, NETHERLANDS		NO	JT8D	17A
12/19/88	820	2			1			40. ISP-PIT	KODIAK, ALASKA		YES	CFM56	3
12/19/88	820	2			1			40. ISP-PIT	LONG ISLAND, NY		YES	CFM56	3
12/19/88	820	2			1			SLA-BUE	SALT LAKE, ARGENTINA		NO	JT8D	9A
12/20/88	844	2			1			BFN-KIM	BLOEMFONTEIN, S. AFRICA		NO	JT8D	17A
12/20/88	844	2			1			BFN-KIM	OITA, JAPAN		NO	JT8D	17A
12/20/88	1301	2			*			AMS	AMSTERDAM, NETHERLANDS		NO	CFM56	3
12/20/88	1301	2			*			AMS	AMSTERDAM, NETHERLANDS		NO	CFM56	3
12/21/88	821	2			*			BFN-JNB	BLOEMFONTEIN, S. AFRICA		NO	JT8D	17A
12/21/88	821	2			*			BFN-JNB	BLOEMFONTEIN, S. AFRICA		NO	JT8D	17A
12/21/88	822	2			*			BFN-JNB	BLOEMFONTEIN, S. AFRICA		NO	JT8D	17A
12/22/88	721	1			1			18. ALB-PHL	PHILA, PA		YES	CFM56	3
12/22/88	1232	2			1			16. ALB-PHL	PHILA, PA		YES	CFM56	3
12/23/88	797	1			1			10. CPT-JNB	HOUSTON, TX		YES	JT8D	3
12/25/88	722	2			1			-HOU	HOUSTON, TX		YES	CFM56	3
12/25/88	723	2			1			LAX-SJC	SAN JOSE, CA		YES	CFM56	3
12/25/88	723	2			1			SAT-DAL	SAN ANTONIO, TX		YES	CFM56	3
12/25/88	723	2			1			PEK-PHX	CHINA		NO	JT8D	17A
12/28/88	724	2			1			YIC-YXD	PHOENIX, AZ		YES	CFM56	3
12/30/88	725	1			1			MDG	DALLAS/FT WORTH, TX		YES	JT8D	15A
12/31/88	726	2			1			BFN-JNB	ARGENTINA		NO	JT8D	17A
12/31/88	727	1			1			LST-MEL	BLOEMFONTEIN, S. AFRICA		NO	CFM56	3
12/31/88	824	1			1			LST-MEL	LAUNCESTON, AUSTRALIA		NO	CFM56	3
01/01/89	1319	1			1			CDG	CHARLES DE GAULLE, FRANCE		NO	JT8D	3
01/03/89	835	2			1			DTW-MDW	CHICAGO, IL-MIDWAY		YES	CFM56	3
01/06/89	836	2			1			-LGM	PALMERSTON NEW ZEALAND		NO	JT8D	3
01/08/89	837	1			1			LAX-YVR	LONDON-GATWICK, ENGLAND		YES	JT8D	17
01/11/89	833	1			1			HNN-HNL	LOS ANGELES, CA		YES	JT8D	9A
01/11/89	833	2			1			-FRA	HANA, HAWAII		YES	CFM56	3
01/12/89	1350	1			1			ADQ-ANC	CORPUS CHRISTI, TX		YES	CFM56	3
01/13/89	844	2			1			JDH-UDR	FRANKFURT, GERMANY		NO	JT8D	17A
01/14/89	1424	1			1			XUS	TOULOUSE, FRANCE		YES	JT8D	17A
01/16/89	845	1			1			ADQ-ANC	ALASKA		YES	JT8D	17A
01/17/89	1342	2			1			JDH-UDR	JODHPUR, INDIA		NO	JT8D	9A
01/19/89	828	2			1			XUS	TIRUCHIRAPPALLI, INDIA		NO	JT8D	9A
01/19/89	829	2			1			LAX	LOS ANGELES, CA		YES	JT8D	9A
01/19/89	1203	1			1			TLS	TOULOUSE, FRANCE		NO	JT8D	17A
01/20/89	846	2			1			UTN-KIM	KIMBERLEY, S. AFRICA		NO	JT8D	9A
01/20/89	1373	1			1			-GRU	SAO PAULO, BRAZIL		NO	CFM56	3
01/22/89	845	2			1			-GIG	RIO DE JANEIRO, BRAZIL		NO	CFM56	3
01/23/89	1044	2			1			LAX	LOS ANGELES, CA		YES	CFM56	3
01/23/89	1045	1			1			TLS	TOULOUSE, FRANCE		NO	CFM56	3
01/26/89	1334	1			1			UTN-KIM	KIMBERLEY, S. AFRICA		NO	CFM56	3
01/27/89	846	1			1			-GIG	SAO PAULO, BRAZIL		NO	CFM56	3
01/27/89	847	2			1			LAX	RIO DE JANEIRO, BRAZIL		YES	CFM56	3
01/27/89	848	2			1			PHI	PALMA, MALLORCA IS, SPAIN		YES	CFM56	3
01/29/89	869	2			1			LTH	LITHUE, KAUAI, HAWAII		YES	CFM56	3
01/29/89	870	2			1			LTH	LITHUE, KAUAI, HAWAII		YES	CFM56	3
01/29/89	1204	2			1			LTH	LITHUE, KAUAI, HAWAII		YES	CFM56	3
01/30/89	871	2			1			LTH	LITHUE, KAUAI, HAWAII		YES	CFM56	3
02/01/89	1411	2			1			LTH	LOS ANGELES, CA		YES	CFM56	3
02/05/89	847	1			*			DUS-CPH	DUSSELDORF, GERMANY		NO	JT8D	15

DATA SOURCES: ENGINE MANUFACTURER OR ICAO

EDATE	EVT#	ENG_POS	DMG_CODE	SEVERITY	POW_LOSS	MAX_VIBE	THROTTLE	IFSD	REMARKS
12/07/88	715	2	A,C	3	NONE	HIGH		VIBES	1 F BLD BENT AT TIP
12/07/88	716	2		9	NONE			NO	
12/07/88	716	2		9	NONE			NO	
12/07/88	1239	2	A,Q	4					
12/07/88	1239	2	A,Q	4					
12/10/88	1283	1	A,K,H	1	NONE	4.0		NO	18 F BLDs + 8 COMP BLDs UNK DAMAGE
12/11/88	717	1	A,H	3	NONE			NO	4 F BLDs MARKED DUE TO SHINGLING
12/11/88	718	1	A,C	3	NONE			NO	FOUND ON GRD INSPEC.
12/11/88	842	2	A,C	3	NONE			NO	
12/11/88	843	2	A,C	3	NONE			NO	
12/12/88	843	2		9					
12/13/88	816	2	A,H	9	NONE	YES		NO	
12/14/88	1043	1		3	NONE			NO	
12/14/88	817	1	A,H	9	NONE			NO	
12/15/88	710	1	A,C	9	NONE			NO	
12/18/88	818	2	A,C	3	NONE			NO	
12/19/88	820	2	A,C,H	3	NONE			NO	
12/20/88	820	2	A,H	3	NONE			NO	
12/20/88	844	2	A,H	3	NONE			NO	
12/20/88	1301	1	A,Q	4				NO	
12/20/88	1301	1	A,Q	4				NO	
12/21/88	821	2	A,C	9	NONE			NO	
12/21/88	821	2	A,C	9	NONE			NO	
12/21/88	821	2	A,C	9	NONE			NO	
12/22/88	721	1		3	NONE			NO	
12/22/88	721	1		9	NONE			NO	
12/23/88	722	2		9	NONE			NO	
12/23/88	723	2	A,C,H	9	NONE			NO	
12/23/88	723	2	A,C,H	9	NONE			NO	
12/28/88	723	2	A,C,H	3	NONE			NO	
12/30/88	725	1	A,C,H	3	NONE			NO	
12/31/88	726	1	A	3	NONE			NO	
12/31/88	727	1	A	4	SLIGHT			NO	
12/31/88	824	1		9				NO	
01/01/89	1359	1	A,C,K	9	NONE			NO	
01/03/89	825	2	A,C	3	NONE	SOME		NO	
01/08/89	826	1	A,C	3	YES			NO	
01/08/89	827	1	A,B,H	3				NO	
01/11/89	843	1	A,B,H	3				NO	
01/11/89	1349	2	A,B,H	3				NO	
01/12/89	1350	1	A,Q	4				NO	
01/13/89	844	2		9	NONE			NO	
01/14/89	844	2		9	NONE			NO	
01/14/89	1424	1		9	NONE			NO	
01/16/89	845	2		9	NONE			NO	
01/17/89	1342	1	A,C,H	9	COMPRESSOR	HIGH		NO	
01/19/89	846	2	A,C	3	COMPRESSOR			NO	
01/19/89	846	2	A,C	3	COMPRESSOR			NO	
01/19/89	1203	1	A,C	3	NONE			NO	
01/20/89	846	2		9	NONE			NO	
01/20/89	1333	1		9	NONE			NO	
01/22/89	1333	1		9	NONE			NO	
01/23/89	1043	1		9	NONE			NO	
01/23/89	1043	1	A,Q	9				NO	
01/23/89	1410	1		9				NO	
01/26/89	1334	1		9				NO	
01/27/89	846	2	A,H	3	NONE			NO	
01/27/89	846	2	A,H	3	NONE			NO	
01/27/89	846	2	A,H	3	NONE			NO	
01/29/89	846	2	A,D	3	NONE			NO	
01/29/89	846	2	A,H	3	NONE			NO	
01/30/89	871	1	A,Q	3	NONE			NO	
01/30/89	1204	1	A,Q	3	NONE			NO	
02/01/89	1411	1	A,Q	4	NONE			NO	
02/05/89	847	1		2	NONE			NO	

DATA SOURCES: ENGINE MANUFACTURER OR ICAO

EDATE	EVT#	ENG POS	MFG NO	ETIME	SIGN	EVT	AIRCRAFT	POF	ALTITUDE	SPEED	FL RULES	LT CONDS	WEATHER	CREW AC	BIRD	SEE
02/05/89	1046	1	1758	20:25:00	NONE		200	TAKEOFF	0 80				CLEAR	ATO	NO	SEVERAL
02/05/89	1435	1	89	9:14:00	MULT	BIRDS	300	LANDING	10 135				SOME CLOUDS	NONE	NO	FLOCK
02/06/89	848	1	239		NONE		300	TAKEOFF	0 70		VFR	DAY	PARTLY CLOUD	NONE	NO	SEVERAL
02/06/89	1351	1	89	9:20:00	MULT	ENG	100	CLIMB	500 150			OVERCAST	FOG	ATB	NO	ONE
02/06/89	1351	1	89	9:20:00	MULT	ENG	100	CLIMB	500 150			OVERCAST	FOG	ATB	NO	ONE
02/07/89	850	2	241	20:20:00	NONE		200	TAKEOFF	0 140					NONE	NO	SEVERAL
02/08/89	872	2	891011		MULT	BIRDS	300	APPROACH						ATB	NO	SEVERAL
02/08/89	1208	2	0		NONE		300	TAKEOFF						ATB	NO	SEVERAL
02/10/89	1047	2	1759		NONE		200	UNKNOWN						NONE	NO	SEVERAL
02/11/89	849	2	243	14:32:00	NONE		200	CLIMB	20 130			DAY	CLEAR	NONE	NO	FLOCK
02/11/89	1194	1	0		MULT	BIRDS	200	LANDING	200 145					NONE	NO	FLOCK
02/12/89	851	1	242		NONE		200	UNKNOWN						NONE	NO	FLOCK
02/13/89	1417	1	89	9:12:00	MULT	ENG-BIRDS	100	TAKEOFF	200 160				CLEAR	ATB	NO	FLOCK
02/13/89	1417	2	891012	9:12:00	MULT	ENG-BIRDS	100	TAKEOFF	200 160				CLEAR	ATB	NO	FLOCK
02/14/89	873	2	891012	9:59:00	NONE		300	TAKEOFF				OVERCAST	RAIN	NONE	NO	SEVERAL
02/14/89	1388	2	89		MULT	ENG-BIRDS	300	TAKEOFF	0 130				SOME CLOUDS	NONE	NO	SEVERAL
02/14/89	1388	2	89		MULT	ENG-BIRDS	300	TAKEOFF	0 130				SOME CLOUDS	NONE	NO	SEVERAL
02/15/89	852	2	245	10:44:00	MULT	BIRDS	200	TAKEOFF	0 150				CLEAR	NONE	NO	FLOCK
02/15/89	852	2	891013		NONE		300	UNKNOWN						NONE	NO	FLOCK
02/16/89	853	1	244		MULT	BIRDS	200	TAKEOFF						NONE	NO	FLOCK
02/20/89	875	2	891014		NONE		300	LANDING	0		VFR	DAY	RAIN	NONE	NO	FLOCK
02/20/89	1193	2	891015		NONE		300	UNKNOWN	200 145					NONE	NO	FLOCK
02/21/89	876	2	891015		NONE		300	UNKNOWN						NONE	NO	FLOCK
02/22/89	877	1	246	23:27:00	NONE		300	TAKEOFF	5 140				CLEAR	ATB	NO	SEVERAL
02/22/89	877	1	891016		NONE		300	TAKEOFF	0 120					NONE	NO	FLOCK
02/24/89	1191	2	0		NONE		300	CLIMB	3500 220			NIGHT	CLEAR	NONE	NO	SEVERAL
02/24/89	1192	2	247	20:00:00	NONE		300	LANDING	0 125				PARTLY CLOUD	NONE	YES	ONE
02/26/89	855	1	891017		NONE		300	TAKEOFF	50 140				CLEAR	NONE	NO	SEVERAL
02/27/89	878	1	89		NONE		300	UNKNOWN						NONE	NO	FLOCK
02/28/89	1201	1	89		MULT	BIRDS	300	TAKEOFF	4 160			DAY	CLEAR	NONE	YES	FLOCK
02/28/89	1201	2	89		NONE		300	TAKEOFF	0 80					NONE	NO	SEVERAL
03/02/89	856	2	248	6:57:00	NONE		300	TAKEOFF						NONE	NO	SEVERAL
03/02/89	856	2	891018		NONE		300	UNKNOWN						NONE	NO	SEVERAL
03/02/89	856	2	1760		NONE		300	UNKNOWN						NONE	NO	SEVERAL
03/02/89	1048	1	89	18:35:00	NONE		200	LANDING	0					NONE	NO	SEVERAL
03/02/89	1329	1	156		TRVS	FRAC	200	UNKNOWN						NONE	NO	SEVERAL
03/03/89	857	2	891019		NONE		300	UNKNOWN						NONE	NO	SEVERAL
03/03/89	880	2	89		NONE		300	UNKNOWN						NONE	NO	SEVERAL
03/03/89	1202	1	0		NONE		300	LANDING	10 120			DAY	CLEAR	NONE	NO	ONE
03/03/89	881	1	891020		NONE		300	UNKNOWN						NONE	NO	ONE
03/05/89	926	1	1625		NONE		300	TAKEOFF						NONE	NO	ONE
03/05/89	1316	1	101389		NONE		300	UNKNOWN						NONE	NO	ONE
03/08/89	937	1	1803		NONE		200	TAKEOFF			IFR			NONE	NO	ONE
03/09/89	1049	1	1761	6:40:00	NONE		200	UNKNOWN	10 140				CLEAR	ATB	NO	YES
03/10/89	938	1	1623		NONE		200	TAKEOFF	0					NONE	NO	YES
03/12/89	858	1	157		NONE		200	TAKEOFF	0					NONE	NO	YES
03/14/89	882	1	89	13:53:00	MULT	ENG-BIRDS	300	LANDING	0				SOME CLOUDS	NONE	NO	FLOCK
03/14/89	882	2	891021	13:53:00	MULT	ENG-BIRDS	300	LANDING	0				SOME CLOUDS	NONE	NO	FLOCK
03/15/89	939	1	1624		NONE		200	UNKNOWN						NONE	NO	ONE
03/15/89	1366	2	89	7:27:00	NONE		300	TAKEOFF	20 150			DAY	SOME CLOUDS	NONE	NO	ONE
03/16/89	940	2	1622		NONE		200	TAKEOFF	0 110					NONE	NO	ONE
03/17/89	1399	2	89		NONE		200	LANDING	0 70				CLEAR	NONE	NO	ONE
03/18/89	859	2	253	13:45:00	NONE		200	TAKEOFF						NONE	NO	ONE
03/18/89	861	1	524	17:10:00	MULT	BIRDS	300	TAKEOFF						NONE	NO	ONE
03/19/89	883	2	891022		NONE		400	APPROACH						NONE	NO	ONE
03/20/89	884	1	891023		TRVS	FRAC	200	UNKNOWN	3000			NIGHT	CLEAR	NONE	NO	ONE
03/23/89	860	1	252		NONE		200	UNKNOWN						NONE	NO	ONE
03/23/89	861	1	1626		NONE		300	UNKNOWN						NONE	NO	ONE
03/24/89	885	1	891025		NONE		300	UNKNOWN						NONE	NO	ONE
03/24/89	885	1	891025		NONE		300	UNKNOWN						NONE	NO	ONE
03/26/89	887	1	891026		NONE		300	UNKNOWN						NONE	NO	ONE
03/28/89	1338	1	89	9:55:00	NONE		300	TAKEOFF	0 125			BRIGHT	CLEAR	NONE	NO	YES
03/31/89	888	1	891027	8:00:00	NONE		300	UNKNOWN	0 10					NONE	NO	YES
03/31/89	942	2	1627		NONE		300	UNKNOWN						NONE	NO	YES
04/01/89	889	1	892001	12:25:00	NONE		200	LANDING	0 110				OVERCAST	NONE	NO	ONE
04/01/89	1051	1	1762		NONE		200	UNKNOWN	50 124			DAY	CLEAR	NONE	NO	ONE
04/02/89	1051	1	1762		NONE		300	LANDING	0			DAY	CLEAR	NONE	NO	ONE
04/02/89	1199	2	0	9:15:00	NONE		300	UNKNOWN	0 200			DAY	CLEAR	NONE	NO	ONE
04/03/89	890	1	892002		NONE		300	UNKNOWN						NONE	NO	ONE

DATA SOURCES: ENGINE MANUFACTURER OR ICAO

EDATE	EVT#	ENG_POS	BIRD_NAM	BIRD_SPE	# BIRDS	WT_OZ_1	CTY_PRS	AIRPORT	LOCALE	US_INCID	ENGINE	DASH
02/05/89	1046	1			1			MAA	MADRAS, INDIA	NO	JT80	9A
02/05/89	1435	1			1			AMS	AMSTERDAM, NETHERLANDS	NO	CFM56	3
02/06/89	848	1	DOVE*		1			LTH	LITHUE, KAUAI, HAWAII	YES	JT80	9A
02/06/89	1351	1	COMMON LAPWING	5N1	10.			CDG	PARIS-DE GAULLE, FRANCE	NO	JT80	
02/06/89	1351	2	COMMON LAPWING	5N1	7.7			CDG	PARIS-DE GAULLE, FRANCE	NO	JT80	
02/07/89	850	2			1			MDH	WINDHOEK, NAMIBIA	NO	JT80	17A
02/08/89	872	2			1			MDH	WINDHOEK, NAMIBIA	NO	JT80	17A
02/08/89	1208	2			1			LAX	LOS ANGELES, CA	YES	CFM56	15
02/08/89	1208	2			1			MYR	MYRTLE BEACH, SC	YES	JT80	17A
02/10/89	1047	2	FALCON*		1			HYD-HYD XFO	INDIA	NO	JT80	17A
02/11/89	1194	1	MALLARD	2JB4	32.			PLZ	PORT ELIZABETH, S. AFRICA	NO	JT80	17A
02/11/89	1194	2			38.			ORF	NORFOLK, VA	YES	JT80	7
02/12/89	851	1			1			-LAX XUS	CA	YES	JT80	
02/13/89	1417	1	COMMON LAPWING	5N1	7.7			CAS	CASABLANCA, MOROCCO	NO	JT80	
02/13/89	1417	2	COMMON LAPWING	5N1	7.7			CAS	CASABLANCA, MOROCCO	NO	JT80	3
02/14/89	873	2			1			HAM-FRA	HAMBURG, GERMANY	NO	CFM56	
02/14/89	1388	1	COMMON GULL	14N13	15.			IAH	HOUSTON, TX	YES	JT80	
02/14/89	1388	2	COMMON GULL	14N13	15.			IAH	HOUSTON, TX	YES	JT80	
02/15/89	852	2	COMMON GULL		3.			KIM-CPT	KIMBERLEY, S. AFRICA	NO	JT80	17A
02/15/89	874	1	SWALLOW*		1			LPA	GRAN CANARIA, CANARY ISL	NO	JT80	17A
02/16/89	853	1			1			YHZ	HALIFAX, CANADA	NO	CFM56	9A
02/20/89	875	2			1			YHZ	HALIFAX, CANADA	NO	CFM56	9A
02/20/89	875	2			1			TCT	TENERIFE, CANARY ISL	YES	JT80	3
02/20/89	1093	2	SWALLOW*		1			LAX	LOS ANGELES, CA	YES	JT80	3
02/21/89	876	2			1			LAX	LOS ANGELES, CA	YES	JT80	3
02/22/89	854	1	KTEWJET*		1			XFO	PHOENIX, AZ	NO	CFM56	17A
02/22/89	877	1	GULL*		1			CPT-JNB	CAPE TOWN, S. AFRICA	NO	CFM56	17A
02/22/89	877	1	GULL*		1			BEG-MOW	BELGRADE, YUGOSLAVIA	NO	CFM56	15
02/24/89	1191	2	HAWK*		1			PHL	PHILADELPHIA, PA	YES	JT80	3
02/24/89	1192	1	KTEWJET*		1			MSY	NEW ORLEANS, LA	YES	CFM56	3
02/25/89	855	1			1			BFN-KIM	BLOEMFONTEIN, S. AFRICA	NO	CFM56	3
02/25/89	855	1			1			-TFS XFO	TENERIFE, CANARY ISL	NO	CFM56	3
02/27/89	878	1	COMMON CROW	22Z85	16.8			MSY	NEW ORLEANS, LA	YES	JT80	3
02/28/89	1201	2			1			XFO	PHOENIX, AZ	NO	CFM56	3
03/01/89	1446	2	SPUR-WINGED PLOVER	5N24	12.			WLG	WELLINGTON, NEW ZEALAND	NO	CFM56	7B
03/02/89	879	1			1			TGD-BEG	YUGOSLAVIA	NO	CFM56	3
03/02/89	1048	1			1			-TRV	INDIA	NO	JT80	17
03/02/89	1329	1			1			AKL	AUCKLAND, NEW ZEALAND	NO	JT80	15
03/03/89	880	2	MOURNING DOVE	2P105	4.			XUS	PHOENIX, AZ	YES	CFM56	3
03/03/89	880	2			1			XUS	PHOENIX, AZ	YES	CFM56	3
03/03/89	1202	1	WESTERN MEADOW LARK	64Z68	4.			MAF	MIDLAND, TX	YES	CFM56	3
03/05/89	881	1			1			XUS	DALLAS/FT WORTH, TX	YES	CFM56	3
03/05/89	936	1	PURPLE MARTIN	18Z12	2.			LIT	LITTLE ROCK, AR	YES	JT80	9A
03/06/89	1316	1	GREY-HEADED GULL	14N29	7.6			XFO	HAMBURG, GERMANY	NO	CFM56	3
03/08/89	937	1			1			HAM-MUC	HAMBURG, GERMANY	NO	JT80	15
03/09/89	1049	1	BLACK KITE	3K28	28.			HAM-MUC	INDIA	NO	JT80	15
03/10/89	938	1	SPOTTED DOVE	2P65	6.			HAM-MUC	INDIA	NO	JT80	15
03/12/89	858	1	STARLING*		1			XMN	HANOVER, GERMANY	NO	JT80	17A
03/14/89	882	1	STARLING*		1			XMN	XIAMEN, CHINA	NO	JT80	17A
03/14/89	882	2			1			NCL	NEWCASTLE, ENGLAND	NO	CFM56	3
03/15/89	939	1	BLACK-HEADED GULL	14N36	10.			XUS	EDINBURGH, SCOTLAND	YES	CFM56	3
03/15/89	1366	2	WHITE THROATED SPARROW	68Z218	1.			EDI	CHICAGO, IL NY NY	YES	JT80	9A
03/16/89	940	2	COMMON GULL	14N13	15.			MDW	LA GUARDIA, NY	YES	JT80	9A
03/17/89	1399	2	SECRETARY*	9N4	20.			LGA	KIMBERLEY, S. AFRICA	NO	JT80	17A
03/18/89	859	2	SPOTTED THICK-KNEE		15.			CLT-LGA	LA GUARDIA, NY	YES	CFM56	3
03/18/89	861	1	GULL*		1			XFO	SAN JOSE, CA	NO	JT80	17A
03/19/89	883	2			1			XFO	INDIA	NO	JT80	15
03/20/89	884	1	COMMON GULL	14N13	15.			XFO	PORT HARCOURT, NIGERIA	YES	CFM56	3
03/23/89	860	1			1			XFO	SEATTLE/TACOMA, WA	YES	CFM56	3
03/24/89	885	1			1			XFO	SEATTLE/TACOMA, WA	YES	CFM56	3
03/24/89	885	1			1			XFO	SEATTLE/TACOMA, WA	YES	CFM56	3
03/28/89	887	1			1			XFO	PHOENIX, AZ	YES	CFM56	3
03/28/89	1338	1			1			BRE	BREMEN, GERMANY	NO	CFM56	3
03/31/89	888	1			1			CJU	CHEJU, KOREA	YES	CFM56	3
03/31/89	942	2			1			XUS	MO - IL	YES	JT80	9A
04/01/89	889	1			1			ENA	EAST MIDLANDS, ENGLAND	NO	CFM56	3
04/01/89	1051	1			1			XFO	INDIA	NO	JT80	17
04/02/89	1051	1			1			XFO	CHANDIGARH, INDIA	NO	JT80	17
04/02/89	1199	2	COMMON ROCK DOVE	2P1	14.			XUS	DALLAS, TX	YES	CFM56	3
04/03/89	890	1			1			XUS	DALLAS, TX	YES	CFM56	3

DATA SOURCES: ENGINE MANUFACTURER OR ICAO

DATE	EVT#	ENG_POS	DNG_CODE	SEVERITY	POW_LOSS	MAX_VIBE	THROTTLE	IFSD	REMARKS
02/05/89	1046			9				NO	
02/05/89	1435			3					ODOR, 2 ADJACENT BLDS BENT, AM EVENT
02/06/89	848		A,C	3					
02/06/89	1351		A,Q	4					ODOR
02/06/89	850		A,H	3				NO	ENG CHANGE
02/07/89	872		A	4		HIGH		NO	FOUND ON GRD INSPEC
02/08/89	1208			4				NO	PM EVENT
02/10/89	1047			9				NO	FOUND ON GRD INSPEC, ENG CHANGED
02/11/89	849			4				NO	ODOR IN CABIN
02/11/89	1194		A,Q	4				NO	
02/12/89	851			4				NO	ODOR
02/13/89	1417			4				NO	
02/13/89	1417			4				NO	
02/14/89	873			9				NO	
02/14/89	1388			9				NO	
02/14/89	1388			9				NO	
02/15/89	852		A,H	3		3.5		NO	
02/15/89	874		A,C	3				NO	
02/16/89	853			3				NO	
02/20/89	873		A,C	3				NO	
02/20/89	1193		A,B	3				NO	AM EVENT, ODOR
02/21/89	876			3				NO	FOUND ON GRD INSPEC, 1F BLD LE DISTORTED
02/22/89	854		A,H	3				NO	AC YAMED
02/22/89	877			3				NO	ODOR, 4 F BLDS SHINGLED, 2 REPLACED
02/24/89	1191		A,H	3		4.0		NO	PM EVENT
02/24/89	1192		A,H	3				NO	
02/26/89	855			3				NO	
02/27/89	878			9				NO	FOUND ON GRD INSPEC
02/27/89	1201			9				NO	PM EVENT
03/01/89	1446			9				NO	
03/02/89	856		A,G,K	1				NO	
03/02/89	879		A,B	3				NO	ODOR
03/02/89	1048			4				NO	FOUND ON GRD INSPEC, 1F BLD LE DISTORTED
03/02/89	1329		A,Q	4				NO	FOUND ON GRD INSPEC
03/03/89	857			1				NO	ODOR, PM EVENT
03/03/89	880			9				NO	FOUND ON GRD INSPEC
03/03/89	1202			9				NO	ODOR, PM EVENT
03/05/89	881			9				NO	ODOR
03/05/89	936			9				NO	
03/06/89	1316			9				NO	
03/08/89	937			1				NO	
03/09/89	1049			9				NO	
03/10/89	938		A,G	1				NO	ODOR
03/12/89	858		A,D,G	1				NO	3 F BLDS BROKEN, 1 LARGE BIRD
03/14/89	882			2		HIGH		NO	
03/14/89	882			2				NO	
03/15/89	939			9				NO	
03/15/89	1346			9				NO	
03/16/89	940			9				NO	AM EVENT
03/17/89	1399		A,Q	4				VOLUNTARY	
03/18/89	859			9				NO	3 F BLDS DAMAGED
03/18/89	861		A,B,C	3				NO	PM EVENT
03/19/89	883		A,C,H	3				NO	ODOR
03/20/89	884			9				NO	
03/21/89	840		A,I	1				NO	FOUND ON GRD INSPEC
03/22/89	941		A,C	4				NO	1 BENT F BLD
03/24/89	885			1				NO	FOUND ON GRD INSPEC
03/24/89	886			3				NO	FOUND ON GRD INSPEC
03/28/89	887			9				NO	FOUND ON GRD INSPEC
03/28/89	1338			9				NO	
03/31/89	898		A,B	3				NO	2 F BLDS WITH LE DENTS
03/31/89	942			9				NO	
04/01/89	889			2				NO	
04/01/89	1050			9				NO	
04/02/89	1051			9				NO	
04/02/89	1199			9				NO	AM EVENT
04/03/89	890			9				NO	

EDATE	EVT#	ENG_POS	MFG_NO	ETIME	SIGN_EVT	AIRCRAFT	POF	ALTITUDE	SPEED	FL_RULES	LT_CONDS	WEATHER	CREW_AC	CREW_AL	BIRD_SEE
04/04/89	891	1	892003		NONE	300	TAKEOFF	0					NONE		
04/04/89	1448	2			NONE	100	TAKEOFF						NONE		
04/06/89	1413	89			NONE		LANDING					CLEAR	NONE		YES
04/07/89	892	2	892004		NONE	300	TAKEOFF						NONE		
04/07/89	1336	89			NONE	300	TAKEOFF						NONE		SEVERAL
04/07/89	1427	1			NONE	200	TAKEOFF	0 70					ATO		
04/07/89	893	89	892005	19:10:00	NONE	300	TAKEOFF						NONE		
04/08/89	894	2	892006		NONE	300	TAKEOFF						NONE		
04/08/89	895	1	892007	20:40:00	NONE	300	TAKEOFF	0				OVERCAST RAIN	NONE		ONE
04/08/89	896	2	892008		NONE	300	APPROACH	1500 180					NONE		
04/10/89	862	2	251		NONE	200	TAKEOFF						NONE		NO
04/11/89	897	2	892009		NONE	400	LANDING	0					NONE		
04/13/89	898	2	892010		NONE	300	CLIMB						NONE		
04/14/89	1181	2	1651		NONE	200	UNKNOWN						NONE		
04/14/89	1387	89	892011	20:06:00	NONE	300	LANDING	80 250				CLEAR	NONE		SEVERAL
04/15/89	899	2	892012	16:00:00	NONE	300	TAKEOFF	0 135				DRY	NONE		
04/16/89	900	2	1631		MULT	200	TAKEOFF	0				CLEAR	NONE		
04/16/89	943	2	1630		NONE	200	UNKNOWN						NONE		NO
04/16/89	944	2	1630		NONE	200	UNKNOWN					SOME CLOUDS	ATO		ONE
04/16/89	1373	2	89	18:42:00	NONE	200	TAKEOFF	0 102				CLEAR	NONE		SEVERAL
04/16/89	1428	1	89	19:51:00	NONE	200	TAKEOFF	0 90					ATO		ONE
04/19/89	901	1	892013		NONE	200	TAKEOFF						NONE		SEVERAL
04/19/89	946	1	1640	17:49:00	NONE	300	TAKEOFF						NONE		ONE
04/20/89	947	2	1638	20:00:00	NONE	200	CLIMB	1000 155				CLEAR	ATB		FLOCK
04/21/89	948	2	1632	11:30:00	NONE	200	UNKNOWN	530 150					NONE		
04/21/89	949	2	1648		NONE	200	UNKNOWN						NONE		SEVERAL
04/21/89	1052	1	1764	7:30:00	NONE	200	LANDING	100					NONE		
04/23/89	950	1	1633		NONE	200	TAKEOFF						NONE		NO
04/23/89	951	1	1634		NONE	200	UNKNOWN						NONE		YES
04/23/89	1430	2	892014	15:45:00	NONE	300	TAKEOFF	0 80				SOME CLOUDS	ATO		ONE
04/25/89	902	1	892015	16:30:00	NONE	200	LANDING	0 100					NONE		
04/25/89	1365	1	89		NONE	100	TAKEOFF						NONE		
04/25/89	1449	1	892016		NONE	300	UNKNOWN						NONE		
04/26/89	903	2	1635		NONE	200	TAKEOFF						NONE		
04/27/89	953	2	1636	9:45:00	MULT	200	TAKEOFF						NONE		FLOCK
04/28/89	904	2	892017		NONE	300	UNKNOWN	100					NONE		
04/28/89	905	1	892018		NONE	300	UNKNOWN						NONE		
04/29/89	906	2	892019		NONE	300	UNKNOWN						NONE		
04/30/89	907	2	1637	19:31:00	MULT	200	TAKEOFF						NONE		SEVERAL
04/30/89	954	1	89		NONE	200	CLIMB	2700 190		VFR			NONE		ONE
04/30/89	1300	1	89	18:35:00	NONE	200	LANDING	0 135				BELOW CLOUDS	NONE		
05/01/89	1330	1	89	14:16:00	NONE	300	TAKEOFF	0 100					NONE		ONE
05/06/89	1053	1	1765	15:45:00	NONE	200	TAKEOFF	0 120					NONE		YES
05/07/89	908	1	892020	18:00:00	MULT	300	LANDING	0					NONE		NO
05/07/89	955	1	1647		NONE	200	TAKEOFF	150 250				CLOUDY	NONE		
05/08/89	909	1	892021		NONE	400	APPROACH	0					NONE		NO
05/08/89	910	1	892022		NONE	300	LANDING						NONE		
05/08/89	956	2	1641		NONE	200	UNKNOWN						NONE		NO
05/10/89	911	1	892023		NONE	300	UNKNOWN						NONE		NO
05/12/89	912	1	892024		NONE	400	UNKNOWN						NONE		ONE
05/13/89	1381	2	89	17:00:00	NONE	300	TAKEOFF	200 145				OVERCAST	NONE		SEVERAL
05/13/89	1374	2	89	8:45:00	NONE	300	TAKEOFF	0 110				SOME CLOUDS	NONE		SEVERAL
05/13/89	1431	1	892025		NONE	200	APPROACH	300 140				RAIN	NONE		NO
05/14/89	913	1	89		NONE	300	TAKEOFF	0 60				CLEAR	ATO		ONE
05/15/89	1321	1	1642		NONE	300	CLIMB	3000 250				SOME CLOUDS	NONE		SEVERAL
05/16/89	957	1	1642		NONE	200	LANDING	0					NONE		YES
05/17/89	1054	2	1766	18:34:00	MULT	200	TAKEOFF	0 100				SOME CLOUDS	NONE		FLOCK
05/18/89	914	1	892026		NONE	300	TAKEOFF						NONE		SEVERAL
05/19/89	1419	2	89	4:10:00	MULT	300	CLIMB	1000 170				CLEAR	ATO		
05/20/89	915	1	892027		NONE	300	UNKNOWN						NONE		SEVERAL
05/20/89	958	1	1662		NONE	200	UNKNOWN						NONE		
05/20/89	1055	2	1767		NONE	200	UNKNOWN						NONE		
05/20/89	1386	1	89	16:35:00	NONE	300	APPROACH	2500 190				CLEAR	NONE		ONE
05/24/89	1367	1	89	8:20:00	NONE	300	LANDING	0 110					NONE		ONE
05/25/89	916	1	892028		NONE	400	LANDING						NONE		

A SOURCES: ENGINE MANUFACTURER OR ICAO

EDATE	EVT#	ENG_POS	BIRD_NAM	BIRD_SPE	# BIRDS	WT OZ	1	CTY_PRS	AIRPORT	LOCALE	US_INCID	ENGINE	DASH
04/04/89	891	1	RED-VINGED THRUSH	412281	1	2.4		KHI-LHE	KHI	KARACHI, PAKISTAN	NO	CFM56	3
04/04/89	1448	1	COMMON STARLING	21275	1	2.8		FNC-BRU	LBB	LUBBOCK, TX	NO	CFM56	3
04/06/89	1413	1			1				FNC	FUNCHAL, PORTUGAL	YES	CFM56	3
04/07/89	892	2			1				BRE	BREMEN, GERMANY	NO	CFM56	3
04/07/89	1339	1			1				UTN	UPINGTON S. AFRICA	NO	CFM56	3
04/07/89	1427	1			1				-DAL	DALLAS/FT. WORTH TX	YES	CFM56	3
04/08/89	893	2			1				FRA	FRANKFURT, GERMANY	NO	CFM56	3
04/08/89	894	1			1				DUS	DUSSELDORF, GERMANY	NO	CFM56	3
04/08/89	895	1			1				ATH	ATHENS, GREECE	NO	CFM56	3
04/09/89	896	1			1				ORF	NORFOLK, VA	YES	CFM56	3
04/10/89	862	2			1				ORF	LONDON-STANSTED EN. L. ND	NO	CFM56	3
04/11/89	897	2			1				FRA	FRANKFURT, GERMANY	NO	CFM56	3
04/13/89	898	2			1				FRA	FRANKFURT, GERMANY	NO	CFM56	3
04/14/89	1181	1			1				GSO	AFRICA	NO	CFM56	15
04/14/89	1387	2			1				GSO	GREENSBORO, NC	YES	CFM56	3
04/15/89	899	2			1				AMS	AMSTERDAM, NETHERLANDS	NO	CFM56	3
04/16/89	900	2			1				AMS	AMSTERDAM	NO	CFM56	3
04/16/89	943	2			1				AMS	AMSTERDAM	NO	CFM56	3
04/16/89	944	1			1				YHZ	YUL XFO	NO	CFM56	9A
04/16/89	1373	2			1				-MAF	CANADA	YES	CFM56	9A
04/16/89	1428	1			1				OSL	MIDLAND/OOESSA, TX	NO	CFM56	9A
04/19/89	901	1			1				UTN	OSLO, NORWAY	NO	CFM56	9A
04/19/89	946	1			1				SFO	UPINGTON S. AFRICA	NO	CFM56	3
04/20/89	947	2			1				DBI	SAN FRANCISCO, CA	YES	CFM56	3
04/21/89	948	2			1				DBI	DELHI, INDIA	NO	CFM56	17
04/21/89	949	2			1				DBI	EAST LONDON S. AFRICA	NO	CFM56	17A
04/21/89	1052	1			1				SJC	SALT LAKE CITY, UT	YES	CFM56	17A
04/23/89	950	1			1				BLR	COIMBATORE, INDIA	NO	CFM56	17
04/23/89	951	1			1				MED	MEDINA, SAUDI ARABIA	NO	CFM56	17
04/23/89	951	1			1				2. DAL	TX	NO	CFM56	15
04/23/89	1430	2			1				PHO	PALESTINE, ITALY	YES	CFM56	9A
04/25/89	902	1			1				TSV	TONNSVILLE, AUSTRALIA	NO	CFM56	3
04/25/89	1365	1			1				EMA	EAST MIDLANDS, ENGLAND	NO	CFM56	3
04/25/89	1449	1			1				XFO	DALLAS	NO	CFM56	3
04/26/89	903	2			1				-DAL	UNKNOWN TX	YES	CFM56	3
04/27/89	953	2			1				CID	CEDAR RAPIDS, IA	YES	CFM56	3
04/27/89	953	2			1				ORD	CHICAGO, IL	YES	CFM56	7B
04/28/89	904	2			1				-PHX	NEWARK, NJ	YES	CFM56	3
04/28/89	905	1			1				XUS	PHOENIX, AZ	YES	CFM56	3
04/29/89	906	1			1				-BEG	BELGRADE, YUGOSLAVIA	NO	CFM56	3
04/30/89	907	2			1				-SPL	AMSTERDAM	NO	CFM56	3
04/30/89	954	1			1				SAV	SAVANNAH, GA	YES	CFM56	7B
04/30/89	1200	1			1				ATL	ATLANTA, GA	YES	CFM56	7B
05/01/89	1343	1			1				CCU	CALCUTTA, INDIA	NO	CFM56	3
05/01/89	1330	1			1				BCN	BARCELONA, SPAIN	NO	CFM56	3
05/06/89	1053	1			1				DEL	DELHI, INDIA	NO	CFM56	3
05/07/89	908	1			1				CTU	CHENGDU, CHINA	NO	CFM56	3
05/07/89	955	1			1				MGA	MANAGUA, NICARAGUA	NO	CFM56	3
05/08/89	909	1			1				BRU	BRUSSELS, BELGIUM	NO	CFM56	3
05/08/89	910	1			1				DET	DETROIT, MI	YES	CFM56	3
05/08/89	956	2			1				-YHZ	CANADA	NO	CFM56	9A
05/10/89	911	1			1				XUS	IONA - ARIZONA	YES	CFM56	3
05/12/89	912	1			1				-LGV	LONDON-GATWICK, ENGLAND	YES	CFM56	3
05/12/89	1381	1			1				XFO	BOSTON, MA	YES	CFM56	3
05/13/89	1374	2			1				BOS	BOSTON, MA	YES	CFM56	3
05/13/89	1431	1			1				FRA	FRANKFURT, GERMANY	NO	CFM56	3
05/14/89	913	1			1				LEA	REUS, SPAIN	NO	CFM56	3
05/15/89	1321	1			1				AJA	AJACCIO, FRANCE	NO	CFM56	3
05/16/89	957	1			1				LIT	LITTLEROCK, AK	YES	CFM56	3
05/17/89	1054	2			1				FCO	ROME-DA VINCI, ITALY	NO	CFM56	15A
05/17/89	1340	1			1				UDR	INDIA	NO	CFM56	9A
05/18/89	1340	1			1				BRE	BREMEN, GERMANY	NO	CFM56	3
05/18/89	914	1			1				TFS	TENERIFE, CANARY ISLANDS	NO	CFM56	3
05/19/89	1419	2			1				MUC	MUNICH, GERMANY	NO	CFM56	3
05/20/89	915	1			1				XFO	FRANKFURT, GERMANY	NO	CFM56	3
05/20/89	958	1			1				-FRA	TURKEY - ENGLAND	NO	CFM56	15A
05/20/89	1055	2			1				1ST	INDIA	NO	CFM56	15
05/20/89	1386	1			1				XFO	LONDON-HEATHROW, ENGLAND	NO	CFM56	3
05/24/89	1367	1			1				EDJ	EDINBURGH, SCOTLAND	NO	CFM56	3
05/25/89	916	1			1				KEF	REYKJAVIK, ICELAND	NO	CFM56	3

DATA SOURCES: ENGINE MANUFACTURER OR ICAO

EDATE	EVT#	ENG %OS	DMG CODE	SEVERITY	POW LOSS	MAX VIBE	THROTTLE	IFSD	REMARKS
04/04/89	891	1		9	NONE	2.5		NO	
04/04/89	1448	2		9	NONE			NO	
04/06/89	1413	1	A,B	9	NONE			NO	2 F BLDs WITH SERVICEABLE LE TIP CURL
04/07/89	892	1	A,Q	4				NO	
04/07/89	1339	1	A,Q	4				NO	
04/07/89	1427	1		4				NO	FOUND ON GRD INSPEC
04/08/89	893	1		4				NO	
04/08/89	894	1		4				NO	
04/08/89	895	1		4				NO	
04/08/89	896	1	A,B	9	NONE			NO	STAINS ON 3 F BLDs AND IGV'S
04/09/89	896	1	A,G	3	NONE			NO	1 F BLD WITH LE TIP CURL
04/10/89	862	1	A	2	COMPRESSOR			NO	2 IN. CHIP OUT OF FAN BLADE
04/11/89	897	1	A	4	NONE			NO	1 F BLD DAMAGED, DAMAGE UNKNOWN
04/13/89	898	2	A,B	3	NONE			NO	OIL COOLER CLOGGED, 3 F BLDs LE DAMAGE
04/14/89	1181	2	A,C	3	NONE			NO	
04/14/89	1387	2		3	NONE			NO	
04/15/89	899	3	A,H	3	NONE			NO	
04/16/89	900	3		3	NONE			NO	
04/16/89	943	3	A,H	3	NONE			NO	FOUND ON GRD INSPEC, 2 F BLDs SHINGLED
04/16/89	944	3	A,C,G,H	3	NONE			NO	
04/16/89	1373	2		0				NO	
04/16/89	1428	1		0				NO	
04/19/89	901	1	A,C	3	NONE			NO	
04/19/89	946	1		3	NONE			EGT	
04/20/89	947	1		3	NONE			NO	
04/21/89	948	1	A,B,C,G	3	NONE			NO	
04/21/89	949	2	A,C	3	NONE			NO	
04/21/89	1052	1		0				NO	1 F BLD HAD 1X.75 IN PIECE BROKEN OFF
04/23/89	950	1		0	NONE			NO	
04/23/89	951	1		0	NONE			NO	
04/23/89	1430	1		0	NONE			NO	
04/23/89	1430	2	A,B,G	2	NONE	2.8		NO	ACOUSTIC PANEL DAM, 6 BLDs 1X1.5IN MISS
04/25/89	902	1		2	NONE			NO	
04/25/89	1365	1		0				NO	
04/25/89	1449	1		0				NO	
04/26/89	903	1		0	NONE			NO	FOUND ON GRD INSPEC
04/27/89	952	1		0	COMPRESSOR			NO	AC YAWED
04/27/89	953	1	A,I,K,N	1	COMPRESSOR	HIGH		EGT	2 BLDs TRYSFRAC, 2 BLDs BROKEN RET TANGS
04/28/89	904	1		0	NONE			NO	FOUND ON GRD INSPEC
04/28/89	905	1		0	NONE			NO	FOUND ON GRD INSPEC
04/28/89	906	1		0	NONE			NO	FOUND ON GRD INSPEC
04/29/89	907	1		0	NONE			NO	PM EVENT
04/30/89	954	1	A,G	2	NONE	YES		NO	
04/30/89	1200	1		0				NO	
04/30/89	1343	1	A,Q	4				NO	
05/01/89	1370	1		0				NO	
05/06/89	1053	1	A,D,G	3	NONE			NO	4 FBLDS DAM, METAL IN BEARING CHIP DECTS
05/07/89	908	1	A,B	3	NONE			NO	3-1ST STG BOOSTER VANES DISENGAGED
05/07/89	955	1	A,C,G,L	3	NONE			NO	ODOR, 3 F BLDs DAMAGED
05/08/89	909	1		3	NONE			NO	
05/08/89	910	1	A,E	3	NONE	NONE		NO	8 F BLDs REPLACED, ODOR
05/08/89	956	1		0	NONE			NO	FOUND ON GRD INSPEC
05/10/89	911	2		0	NONE			NO	FOUND ON GRD INSPEC
05/12/89	912	1		0	NONE			NO	
05/12/89	1381	1	A,Q	4				NO	
05/13/89	1374	2	A,Q	4				NO	
05/13/89	1431	1		3	NONE	3.0	RETARD	NO	1 PAIR F BLDs SHINGLED AND REPLACED
05/14/89	913	1	A,H	3	NONE			NO	ODOR, ENG SHUTDOWN ON TAXI IN
05/15/89	1321	1	A,Q	4	NONE			NO	
05/16/89	957	1	A,C	4	NONE			NO	
05/17/89	1054	2		0				NO	
05/17/89	1340	1	A	4	NONE			NO	4 F BLDs DAMAGED, DAMAGE UNKNOWN
05/18/89	914	1		0	NONE			NO	FOUND ON GRD INSPEC
05/19/89	1419	1		0	NONE			NO	
05/20/89	915	2		0	NONE			NO	
05/20/89	958	1		0	NONE			NO	
05/20/89	1055	1		0				NO	
05/20/89	1382	1		0				NO	
05/20/89	1383	1		0				NO	
05/25/89	916	1		0	NONE			NO	

DATA SOURCES: ENGINE MANUFACTURER OR ICAO

EDATE	EVT#	ENG_POS	MFG	NO	ETIME	SIGN	EVT	AIRCRAFT	POF	ALTITUDE	SPEED	FL RULES	LT COMDS	WEATHER	CREW AC	CREW AL	BIRD	SEE
05/25/89	959	1	1643	19:45:00	NONE			200	CLIMB	4000	120	VFR	DAY	CLEAR	NONE	YES	ONE	
05/25/89	960	1	1644	8:00:00	NONE			200	TAKEOFF	200	150			SOME CLOUDS	NONE	NO	ONE	
05/25/89	961	2	89	8:00:00	NONE			300	UNKNOWN	300	135				NONE	NO	ONE	
05/26/89	917	1	892029	14:15:00	NONE			400	APPROACH	3500	210			SOME CLOUDS	NONE	NO	SEVERAL	
05/27/89	918	2	892030	14:15:00	NONE			300	TAKEOFF	0	140			RAIN	DIV		FLOCK	
05/28/89	1347	1	892031	19:01:00	MULT	ENG		400	TAKEOFF	0	140			RAIN	ATB		FLOCK	
05/31/89	919	1	892032	19:01:00	MULT	ENG		400	TAKEOFF	0	140			RAIN	ATB		FLOCK	
05/31/89	919	2	1768	7:37:00	NONE			200	UNKNOWN	2000	165			SOME CLOUDS	NONE	NO	ONE	
05/31/89	1056	2	89	21:20:00	NONE			400	CLIMB	3000	240	VFR	NIGHT	CLEAR	NONE	NO	NO	
05/31/89	1354	1	89	21:20:00	NONE			300	CLIMB	0	90			OVERCAST	NONE	NO	ONE	
06/01/89	1197	1	892033	4:20:00	NONE			300	APPROACH	420	115	VFR	DAY	OVERCAST	NONE	NO	ONE	
06/02/89	920	1	892034	12:26:00	NONE			300	TAKEOFF	0	134			LIGHT RAIN	ATB	NO	SEVERAL	
06/02/89	921	2	892035	12:50:00	NONE			400	TAKEOFF	0	135			LIGHT RAIN	ATB	NO	ONE	
06/02/89	922	1	892036	20:09:00	NONE			300	UNKNOWN	2500	180			SOME CLOUDS	NONE	NO	ONE	
06/03/89	923	1	89	9:40:00	NONE			300	UNKNOWN	40	140			OVERCAST	NONE	NO	FLOCK	
06/03/89	1450	1	892037	12:03:00	NONE	BIRDS		300	TAKEOFF	0	120			CLEAR	NONE	YES	SEVERAL	
06/04/89	1196	1	1649	16:48:00	MULT	BIRDS		200	TAKEOFF	0	90			CLEAR	ATO	NO	FLOCK	
06/05/89	924	1	892038	7:11:00	NONE			200	TAKEOFF	0	110			SOME CLOUDS	ATO	NO	SEVERAL	
06/07/89	925	2	892039	21:05:00	TRVS	FRAC		200	TAKEOFF	50	145	IFR	DAY	OVERCAST	ATB	YES	SEVERAL	
06/08/89	926	2	962	21:05:00	TRVS			200	UNKNOWN	0	137			CLEAR	NONE	NO	ONE	
06/09/89	1420	2	1769	7:43:00	NONE			200	UNKNOWN	0	165				NONE	NO	SEVERAL	
06/10/89	927	1	1770	10:56:00	NONE			200	TAKEOFF	500	140				NONE	NO	SEVERAL	
06/10/89	927	1	89	10:56:00	NONE			200	TAKEOFF	0	137				ATO	NO	FLOCK	
06/10/89	1360	1	89	10:56:00	NONE			200	APPROACH	0	140				NONE	NO	SEVERAL	
06/11/89	1360	2	89	10:56:00	NONE			200	UNKNOWN	0	137				NONE	NO	SEVERAL	
06/11/89	1360	2	89	10:56:00	NONE			200	UNKNOWN	0	137				NONE	NO	SEVERAL	
06/12/89	961	1	892041	10:35:00	MULT	BIRDS		300	TAKEOFF	0	100			OVERCAST	NONE	NO	ONE	
06/12/89	961	2	892042	10:35:00	MULT	BIRDS		300	TAKEOFF	0	165			SOME CLOUDS	NONE	NO	SEVERAL	
06/12/89	1406	2	89	10:35:00	MULT	BIRDS		300	TAKEOFF	0	165			CLEAR	NONE	NO	SEVERAL	
06/13/89	962	1	892043	12:00:00	NONE			300	TAKEOFF	0	137				NONE	NO	SEVERAL	
06/13/89	962	1	1650	12:00:00	NONE			200	TAKEOFF	0	137				NONE	NO	SEVERAL	
06/13/89	1058	1	89	12:00:00	NONE			200	TAKEOFF	0	137				NONE	NO	SEVERAL	
06/14/89	963	1	89	12:00:00	NONE			200	TAKEOFF	0	137				NONE	NO	SEVERAL	
06/14/89	963	1	89	12:00:00	NONE			200	TAKEOFF	0	137				NONE	NO	SEVERAL	
06/15/89	928	2	892041	10:50:00	NONE			200	UNKNOWN	0	137				NONE	NO	SEVERAL	
06/16/89	929	2	892042	10:50:00	NONE			200	UNKNOWN	0	137				NONE	NO	SEVERAL	
06/18/89	1377	1	89	10:50:00	NONE			200	UNKNOWN	0	137				NONE	NO	SEVERAL	
06/18/89	1418	2	89	10:50:00	NONE			200	UNKNOWN	0	137				NONE	NO	SEVERAL	
06/19/89	930	2	892043	10:56:00	NONE			200	UNKNOWN	0	137				NONE	NO	SEVERAL	
06/19/89	930	2	1650	10:56:00	NONE			200	UNKNOWN	0	137				NONE	NO	SEVERAL	
06/19/89	930	2	89	10:56:00	NONE			200	UNKNOWN	0	137				NONE	NO	SEVERAL	
06/20/89	1362	1	89	10:56:00	NONE			200	UNKNOWN	0	137				NONE	NO	SEVERAL	
06/20/89	1362	2	89	10:56:00	NONE			200	UNKNOWN	0	137				NONE	NO	SEVERAL	
06/20/89	1059	1	1651	10:50:00	NONE			200	UNKNOWN	0	137				NONE	NO	SEVERAL	
06/21/89	931	1	892044	6:50:00	NONE			200	UNKNOWN	0	137				NONE	NO	SEVERAL	
06/21/89	1325	1	89	6:50:00	NONE			200	UNKNOWN	0	137				NONE	NO	SEVERAL	
06/21/89	1325	1	89	6:50:00	NONE			200	UNKNOWN	0	137				NONE	NO	SEVERAL	
06/22/89	965	1	1652	18:10:00	NONE			200	TAKEOFF	0	110				NONE	NO	SEVERAL	
06/22/89	965	1	89	18:10:00	NONE			200	TAKEOFF	0	110				NONE	NO	SEVERAL	
06/22/89	1195	1	89	17:45:00	NONE			200	TAKEOFF	0	110				NONE	NO	SEVERAL	
06/23/89	932	2	892045	19:30:00	NONE			200	CLIMB	0	135				NONE	NO	SEVERAL	
06/24/89	933	1	892046	19:30:00	NONE			200	TAKEOFF	0	135				NONE	NO	SEVERAL	
06/24/89	966	1	1653	5:50:00	TRVS	FRAC		200	TAKEOFF	0	135				NONE	NO	SEVERAL	
06/24/89	966	1	89	5:50:00	TRVS	FRAC		200	TAKEOFF	0	135				NONE	NO	SEVERAL	
06/24/89	1378	2	89	6:05:00	MULT	ENG-BIRDS		300	TAKEOFF	0	135				NONE	NO	SEVERAL	
06/24/89	1378	2	89	6:05:00	MULT	ENG-BIRDS		300	TAKEOFF	0	135				NONE	NO	SEVERAL	
06/25/89	934	2	892047	18:25:00	NONE			300	TAKEOFF	0	135				NONE	NO	SEVERAL	
06/26/89	935	1	892048	12:30:00	NONE			300	CLIMB	300	180				NONE	NO	SEVERAL	
06/27/89	1324	1	89	19:30:00	MULT	BIRDS		300	LANDING	300	180				NONE	NO	SEVERAL	
06/28/89	967	2	1654	6:30:00	NONE			200	TAKEOFF	100	133				NONE	NO	SEVERAL	
06/28/89	968	1	1655	6:30:00	NONE			200	TAKEOFF	0	110				NONE	NO	SEVERAL	
06/29/89	1368	2	89	10:36:00	NONE			200	TAKEOFF	0	97				NONE	NO	SEVERAL	
06/29/89	1368	2	89	10:36:00	NONE			200	LANDING	10	135				NONE	NO	SEVERAL	
07/02/89	1415	1	89	6:18:00	MULT	ENG-BIRDS		200	LANDING	10	135				NONE	NO	SEVERAL	
07/02/89	1415	1	89	6:18:00	MULT	ENG-BIRDS		200	LANDING	10	135				NONE	NO	SEVERAL	
07/03/89	1060	2	1772	22:55:00	NONE			200	CLIMB	0	80				NONE	NO	SEVERAL	
07/04/89	1115	2	892001	3:24:00	NONE			200	TAKEOFF	0	80				NONE	NO	SEVERAL	
07/06/89	1394	2	1656	3:24:00	NONE			200	TAKEOFF	0	80				NONE	NO	SEVERAL	
07/06/89	1394	2	89	3:24:00	NONE			200	TAKEOFF	0	80				NONE	NO	SEVERAL	
07/07/89	1116	2	892002	13:43:00	NONE			200	UNKNOWN	0	80				NONE	NO	SEVERAL	
07/08/89	970	2	1796	13:43:00	NONE			200	UNKNOWN	0	80				NONE	NO	SEVERAL	
07/08/89	1422	2	89	13:43:00	NONE			200	TAKEOFF	0	80				NONE	NO	SEVERAL	
07/09/89	1117	2	892003	17:20:00	NONE			200	TAKEOFF	0	80				NONE	NO	SEVERAL	
07/09/89	1344	2	89	17:20:00	NONE			200	LANDING	0	80				NONE	NO	SEVERAL	
07/10/89	971	1	1778	17:20:00	TRVS	FRAC		200	TAKEOFF	0	80				NONE	NO	SEVERAL	

DATA SOURCES: ENGINE MANUFACTURER OR ICAO

EDATE	EVT#	ENG POS	BIRD_NAM	BIRD_SPE	# BIRDS	WT OZ	1	CTY	PRS	AIRPORT	LOCALE	US_INCID	ENGINE	DASH
05/25/89	959	1	KESTREL	5K27	1	8.0	1	AM	JED	EAM	NEJRAH, SAUDI ARABIA	NO	JT8D	15
05/25/89	960	1	ROCK DOVE	2P1	1	14.0	1	AM	JED	DAL	DALLAS/FT. WORTH, TX	YES	JT8D	9A
05/25/89	1361	1								GOI	GOA, INDIA	NO	JT8D	
05/26/89	917	2								-IAH	HOUSTON, TX	YES	CFM56	3
05/27/89	918	2								ALC	ALICANTE, SPAIN	NO	CFM56	3
05/28/89	1347	1								CHI	CARDIFF-VALES, ENGLAND	NO	CFM56	3
05/31/89	919	2	BLACK-HEADED GULL	14N36	1	9.7	1			VCE	VENICE, ITALY	NO	CFM56	3
05/31/89	1056	2	BLACK-HEADED GULL	14N36	1	9.7	1			VCE	VENICE, ITALY	NO	CFM56	3
05/31/89	1354	1								MAA-BLR	INDIA	NO	CFM56	17A
05/31/89	1403	1								RKPC	CHENJU, KOREA	NO	JT8D	
05/31/89	1197	1	SPARROW*		1		1			LCA	LARNACA, CYPRUS	NO	JT8D	
06/02/89	920	1								TPA	TAMPA, FL	YES	CFM56	3
06/02/89	921	2								FRA	FRANKFURT, GERMANY	NO	CFM56	3
06/02/89	922	1								FRA	FRANKFURT, GERMANY	NO	CFM56	3
06/03/89	923	1	BLACK-HEADED GULL	14N36	1		1			SYD	SYDNEY, AUSTRALIA	NO	CFM56	3
06/03/89	1450	1								XFO	COPENHAGEN, DENMARK	NO	CFM56	3
06/04/89	1196	1	COMMON GULL	14N13	1	15.0	1			SLC	SALT LAKE CITY, UT	YES	CFM56	3
06/05/89	924	1	ROCK DOVE*		1	14.0	1			LHR	LONDON-HEATHROW, ENGLAND	NO	CFM56	3
06/07/89	925	2								EDI	EDINBURGH, SCOTLAND	NO	CFM56	3
06/08/89	926	2	SWALLOW*		1		1			XFO	SEGUL, S. KOREA	NO	CFM56	3
06/09/89	1420	2								MUC	MUNICH, GERMANY	NO	CFM56	3
06/10/89	927	1	HOUSE MARTIN	18269	1		1			XUS	HOUSTON, TX	YES	CFM56	3
06/10/89	1360	1	HAWK*		1	0.6	1			NCE	NICE, FRANCE	NO	JT8D	17A
06/11/89	1337	2	CROWNED LAPWING	5N11	1		1			TNG	TANGIER, MOROCCO	NO	JT8D	17A
06/12/89	961	1	GULL*	13N4	1		1			PLZ	PORT ELIZABETH, S. AFRICA	NO	JT8D	17A
06/12/89	1406	2	POMARINE JAEGER		1	24.0	1			LXS	LENOS, GREECE	YES	JT8D	17A
06/13/89	962	1								PDB	PEDRO BAY, ALASKA	NO	JT8D	17A
06/13/89	1057	1								XFO	INDIA	NO	JT8D	17A
06/13/89	1058	1								-SRX	INDIA	NO	JT8D	17A
06/14/89	1059	2	KITE*		1		1			FMMI	IVATO, MADAGASCAR	NO	JT8D	17A
06/15/89	928	1	COMMON CROW	22285	1	16.8	1			XFO	ENGLAND - DENMARK	NO	CFM56	3
06/16/89	929	2								XFO	HANOVER, GERMANY	NO	CFM56	3
06/18/89	1377	1								LGH	LONDON-GATWICK, ENGLAND	NO	CFM56	3
06/18/89	1418	2	GULL*		2	15.0	1			PUY	CASABLANCA, MOROCCO	NO	JT8D	3
06/19/89	930	2								HOU	PULA, YUGOSLAVIA	NO	CFM56	3
06/19/89	963	1								DEL	HOUSTON, TX	YES	JT8D	78
06/19/89	1362	1								XFO	DELHI, INDIA	NO	JT8D	15
06/20/89	964	2								XFO	JEDDAH, SAUDI ARABIA	NO	JT8D	17
06/20/89	1059	1								TRV	TRIVANDRUM, INDIA	NO	CFM56	3
06/21/89	931	1	CROW*		1		1			XFO	SYDNEY, AUSTRALIA	NO	JT8D	3
06/21/89	1322	1								AMD	AMMADABAD, INDIA	NO	CFM56	3
06/21/89	1323	1								ALC	ALICANTE, SPAIN	NO	CFM56	15
06/22/89	965	1	GULL*	14N13	1	15.0	1			MAH	MAHON, MENORCA, SPAIN	NO	JT8D	9
06/22/89	1195	1	COMMON GULL	14N14	1	35.9	1			DAB	DAYTONA BEACH, FL	YES	CFM56	3
06/23/89	932	2	HERRING GULL	3K28	1	28.0	1			IBZ	IBIZA, SPAIN	NO	CFM56	78
06/24/89	933	1	PIGEON*		1					LCA	LARNACA, CYPRUS	NO	CFM56	3
06/24/89	966	1	BLACK KITE		1					LDE	TARBES, FRANCE	NO	JT8D	78
06/24/89	1378	1								LGH	LONDON-GATWICK, ENGLAND	NO	CFM56	3
06/24/89	1379	2								LGM	LONDON-GATWICK, ENGLAND	NO	CFM56	3
06/25/89	934	2	GULL*		1	16.0	1			SVG	STAVANGER, NORWAY	NO	CFM56	3
06/26/89	935	1	COMMON WOOD PIGEON	2P9	1		1			LGM	LONDON-GATWICK, ENGLAND	NO	CFM56	3
06/27/89	1324	1	KITEWET*		1		1			ALY	ALEXANDRIA, EGYPT	NO	CFM56	3
06/28/89	967	2								BFN	BLOEMFONTEIN, S. AFRICA	NO	JT8D	17A
06/28/89	968	2	CROW*		1	40.0	1			YHZ	HALIFAX, CANADA	NO	CFM56	9A
06/29/89	1368	1	HERRING GULL	14N14	1	40.0	1			EDI	EDINBURGH, SCOTLAND	NO	CFM56	3
07/02/89	1412	2	HERRING GULL		1		1			BRS	BRISTOL, ENGLAND	NO	JT8D	9A
07/02/89	1413	2	KITE*		1		1			BRS	BRISTOL, ENGLAND	NO	JT8D	9A
07/03/89	1060	2								GOI	GOA, INDIA	NO	JT8D	9A
07/04/89	1115	1	BURROWING OWL	2S102	1	5.0	1			BRE	BREMEN, GERMANY	NO	CFM56	3
07/06/89	969	2	COMMON GULL	14N13	1	15.0	1			YHC	CALGARY, CANADA	NO	JT8D	9A
07/06/89	1394	2	VULTURE*		1		1			CPH	COPENHAGEN, DENMARK	NO	JT8D	3
07/07/89	1116	2	MOURNING DOVE		1	4.0	1			XFO	MONTEREY, MEXICO	NO	CFM56	9A
07/08/89	970	2								XUS	DALLAS, TX	YES	JT8D	9A
07/08/89	1423	2	COMMON GULL		1		1			ORY	PARIS-ORLY, FRANCE	YES	JT8D	3
07/09/89	1117	2	VULTURE*		1		1			ROA	ROANOK, VA	YES	CFM56	3
07/09/89	1344	2								CCU	CALCUTTA, INDIA	NO	JT8D	9A
07/10/89	971	1								MSY	NEW ORLEANS, LA	YES	JT8D	9A

DATA SOURCES: ENGINE MANUFACTURER OR ICAO

EDATE	EV#	ENG_POS	DMG_CODE	SEVERITY	POW_LOSS	MAX_VIBE	THROTTLE	IFSD	REMARKS
05/23/89	959	1	A,C	3	YES	YES	NO	NO	3 BLDs BENT, IMMEDIATE EPR+32M1 RECOVERY
05/25/89	960	1	A,C	3	NONE		YES	YES	COOR, AM EVENT
05/25/89	1361	1		3	NONE				FOUND ON GRD INSPEC
05/26/89	017	2		3	NONE				5 F BLDs MIDSPAN SHROUD DAMAGE
05/27/89	018	2	A,H	3	NONE	5.0			
05/28/89	1347	1	A,H	3	SOME	3.0			AIRCRAFT SPEED DROPPED, 2 BENT F BLDs
05/31/89	919	1	A,C,H	3	SOME	1.5			AIRCRAFT SPEED DROPPED, 5 F BLDs BENT
05/31/89	1056	2	A,D,H	2	SOME				5 F BLDs DAMAGED
05/31/89	1354	1	A,D,G,H	2					
05/31/89	1403	1		2					
06/01/89	1403	1		2					
06/02/89	920	1	A,H	3	NONE	3.8			3 F BLDs UNK DAMAGE, PM EVENT
06/02/89	921	1		3	NONE				ENGINE NOISE, 2 PAIR OF F BLDs REPLACED
06/02/89	922	1		3	NONE				CABIN COOR, CONFIRMED ON GRD INSPEC
06/03/89	923	1	A,H	3	NONE	2.5	RETARD		3 F BLDs SHINGLED
06/03/89	1450	1		3					
06/04/89	1196	1		3					AM EVENT
06/05/89	924	1	A,C,H	3	NONE				4 PAIR F BLDs REPLACED
06/07/89	925	2	A,C,H	3	NONE	1.8			2 BENT F BLDs, 2 SHINGLED F BLDs
06/08/89	926	2	A,C,H	3	NONE	2.0			ACOUSTIC PANEL DAMAGE, 3 F BLDs DAMAGED
06/09/89	1420	2		3					
06/10/89	927	1	A,C,H	3	NONE	NONE			3 F BLDs DAMAGED, FOUND ON GRD INSPEC
06/11/89	1337	1	A,Q	3					
06/12/89	931	2	A,C	4					2 F BLDs BENT
06/13/89	1406	2		3					
06/13/89	962	1	A,D,I,K	1	COMPRESSOR	HIGH	IDLE	VOLUNTARY	4 SURGES RETARD TO IDLE THEN VOL IFSD
06/13/89	1057	1		1				NO	FOUND ON GRD INSPEC
06/13/89	1058	1		1				NO	
06/14/89	1300	2		2				NO	ACOUSTIC PANEL DAMAGE, 5 F BLDs DAMAGED
06/15/89	928	2	A,D,H	2	NONE			NO	2 F BLDs HEAVY TIP CURL
06/16/89	929	2	A,B	3	NONE			NO	
06/18/89	1377	2		3					
06/18/89	1418	2		2					
06/19/89	930	1	A,D,G,H	2	NONE	SOME	RETARD	NO	1 F BLD TIP CORNER MISSING, 25F BLDs DAM
06/19/89	933	1	A	2	COMPRESSOR				
06/19/89	1342	1		4					
06/20/89	944	2	A,H	3					
06/20/89	1059	1		3	NONE				FOUND ON GRD INSPEC
06/21/89	931	1		1					
06/21/89	1322	1		1					
06/21/89	1325	1		1					
06/22/89	935	1	A	4	COMPRESSOR			NO	SEVERE F BLD DAM, AC YAWED
06/23/89	1195	1	A,B	3	NONE	3.5		NO	2 F BLDs REPLACED DUE TO LE
06/23/89	937	1		1	NONE	2.2		NO	FAN CASE SEPARATED AND MOVED FORWARD
06/24/89	938	1	A,I,M,P	1		YES	RETARD	NO	
06/24/89	1378	2		1					
06/24/89	1378	2		2					
06/25/89	934	2	A,C,H	3	NONE	4.0		NO	SEVERAL F BLDs DAMAGED
06/26/89	935	1	A,B,H	3	NONE	3.5	IDLE	NO	9 F BLDs DAMAGED
06/27/89	1342	1		3					
06/28/89	937	1		3					
06/28/89	938	1		3	NONE			NO	COOR
06/29/89	1368	1		3					
07/02/89	1415	2	A,Q	1					
07/02/89	1415	2		1					
07/03/89	1040	1		2					
07/04/89	1115	1		2					
07/04/89	949	2	A,Q	1	NONE				FOUND ON GRD INSPEC
07/06/89	1394	2		2					
07/07/89	1116	2	A,C	3	NONE			NO	
07/08/89	970	2		3				NO	
07/08/89	1422	2	A,G	2	NONE	SOME		NO	9 F BLDs DAM, 1 BLD TIP PIECE BROKEN OFF
07/09/89	1117	2		2				NO	ENG OIL LIGHT CAME ON
07/09/89	1344	1	A,I,K	1	COMPRESSOR			NO	
07/10/89	971	1		1					

DATA SOURCES: ENGINE MANUFACTURER OR ICAO

EDATE	EV#	ENG POS	MFG NO	ETIME	SIGN	EVT	AIRCRAFT	POF	ALTITUDE	SPEED	FL RULES	LT CONDS	WEATHER	CREW AC	BIRD SEE
07/10/89	1118	2	892004		NONE		300	CLIMB						NONE	
07/11/89	972	2	1657		NONE		200	APPROACH						NONE	
07/11/89	1119	1	892005		NONE		300	LANDING		0				NONE	
07/12/89	973	2	1658		NONE		200	TAKEOFF		0				ATO	
07/12/89	974	1	1659		NONE		200	LANDING		0				NONE	NO
07/12/89	975	2	1780		NONE		200	UNKNOWN						NONE	
07/13/89	976	2	1660		NONE		200	TAKEOFF		0				ATO	
07/13/89	977	1	1661		NONE		200	LANDING						NONE	
07/13/89	978	2	1783	19:20:00	NONE		200	CLIMB						NONE	
07/15/89	1400	1	89	8:45:00	NONE		300	TAKEOFF		0				OTHER	ONE
07/16/89	1180	1	1820	15:05:00	TRVS		200	LANDING		50			RAIN	NONE	
07/17/89	979	2	1785	18:40:00	TRVS	FRAC	200	LANDING		130			CLEAR	NONE	SEVERAL
07/17/89	980	2	1784		NONE		200	UNKNOWN						NONE	
07/17/89	1440	1	89		NONE		200	APPROACH					SOME CLOUDS	NONE	NO
07/18/89	995	2	1786	21:35:00	TRVS	FRAC	200	TAKEOFF		137				ATO	NO
07/18/89	1120	2	892006		NONE		400	UNKNOWN						NONE	
07/18/89	1121	1	892007	18:00:00	NONE		300	TAKEOFF						DIV	
07/18/89	1122	1	892008		NONE		400	LANDING		0			CLEAR	NONE	ONE
07/18/89	1371	2	89		NONE		300	TAKEOFF		0			SOME CLOUDS	NONE	SEVERAL
07/18/89	1451	1	89	15:40:00	NONE		200	TAKEOFF		0			CLEAR	ATB	ONE
07/19/89	1335	2	89	6:33:00	NONE		200	APPROACH		600			CLEAR	NONE	SEVERAL
07/19/89	1382	2	1787		NONE		300	TAKEOFF		0				NONE	SEVERAL
07/20/89	981	2	89		MULT	BIRDS	200	LANDING		0				NONE	
07/20/89	1456	2	89		MULT	BIRDS	300	TAKEOFF		0				NONE	SEVERAL
07/21/89	1123	1	892009		NONE		300	UNKNOWN						NONE	
07/22/89	1352	2	89	11:15:00	NONE		100	LANDING		200			OVERCAST	NONE	OTHER
07/22/89	1356	1	89	8:25:00	NONE		200	TAKEOFF		0				NONE	NO
07/22/89	1401	1	89	7:00:00	NONE		300	TAKEOFF		0				NONE	NO
07/23/89	1434	1	89		NONE		200	APPROACH		1000			CLEAR	NONE	ONE
07/23/89	1391	1	89	7:20:00	NONE		200	LANDING		0			SOME CLOUDS	NONE	
07/24/89	1124	1	892010		NONE		300	UNKNOWN		0				NONE	
07/25/89	982	1	1789	14:30:00	NONE		200	UNKNOWN						NONE	
07/26/89	983	2	1788		NONE		200	TAKEOFF						NONE	
07/26/89	1125	1	892011		NONE		300	UNKNOWN						NONE	
07/27/89	1126	2	892012		NONE		300	LANDING		0			SOME CLOUDS	NONE	SEVERAL
07/27/89	1127	2	892013	9:57:00	MULT	ENG-BIRDS	300	LANDING		110			SOME CLOUDS	NONE	SEVERAL
07/27/89	1431	2	89	9:57:00	MULT	ENG-BIRDS	300	LANDING		0				NONE	
07/27/89	1431	2	89	14:00:00	NONE		300	LANDING		0			CLEAR	NONE	SEVERAL
07/27/89	1431	1	89		NONE		200	CLIMB		400				NONE	
07/28/89	984	2	1791	12:00:00	NONE		200	UNKNOWN		20				NONE	YES
07/28/89	985	2	1790	18:00:00	TRVS	FRAC	200	TAKEOFF						ATB	
07/28/89	1128	2	892014		NONE		300	CRUISE						NONE	
07/28/89	1129	2	892015		NONE		300	UNKNOWN						NONE	
07/28/89	1189	1	1761	8:17:00	NONE		200	LANDING		0			CLEAR	NONE	FLOCK
07/28/89	1441	1	89	12:00:00	MULT	ENG-BIRDS	200	TAKEOFF		0			SOME CLOUDS	NONE	FLOCK
07/28/89	1441	2	89	12:00:00	MULT	ENG-BIRDS	200	TAKEOFF		0				NONE	
07/29/89	1130	1	892016		NONE		400	LANDING		0			CLEAR	NONE	SEVERAL
07/29/89	1370	2	89		MULT	BIRDS	200	CLIMB		500			CLEAR	NONE	ONE
07/29/89	1432	2	89		NONE		200	LANDING		0				NONE	
07/30/89	986	1	1792		NONE		300	APPROACH		0			CLEAR	NONE	ONE
07/30/89	1131	1	892017		NONE		300	TAKEOFF		0			CLEAR	NONE	ONE
07/30/89	1132	1	892018	12:40:00	NONE		100	TAKEOFF		0			DAY	ATO	
07/30/89	1434	2	89		NONE		300	UNKNOWN					OVERCAST	NONE	
07/31/89	1133	1	892019		NONE		300	CLIMB		0				NONE	
07/31/89	1134	2	892020		NONE		300	TAKEOFF		0				NONE	ONE
07/31/89	1341	1	89	8:20:00	NONE		100	TAKEOFF		0				NONE	ONE
07/31/89	1353	2	89	15:59:00	NONE		400	TAKEOFF		0				NONE	
08/01/89	1135	1	892021		NONE		200	UNKNOWN		35			OVERCAST	NONE	1
08/01/89	1426	1	89	12:50:00	NONE		200	TAKEOFF		140			CLEAR	NONE	FLOCK
08/01/89	1426	1	89	10:30:00	MULT	ENG-BIRDS	200	APPROACH		0			CLEAR	NONE	FLOCK
08/01/89	1426	1	89	10:30:00	MULT	ENG-BIRDS	200	APPROACH		0				NONE	YES
08/01/89	1426	2	892022		NONE		300	TAKEOFF		0				NONE	YES
08/02/89	1136	1	89		NONE		200	CLIMB		0				NONE	
08/02/89	1190	1	89		NONE		200	TAKEOFF		100			CLEAR	NONE	SEVERAL
08/02/89	1206	1	89	9:05:00	NONE		200	UNKNOWN		0			SOME CLOUDS	NONE	SEVERAL
08/02/89	1429	2	89	9:05:00	MULT	ENG-BIRDS	200	LANDING		0			SOME CLOUDS	OTHER	SEVERAL
08/03/89	1450	2	1793		MULT	ENG-BIRDS	200	LANDING		0				OTHER	YES
08/03/89	987	2			NONE		200	LANDING		0				NONE	

DATA SOURCES: ENGINE MANUFACTURER OR ICAO

EDATE	EVT#	ENG_POS	BIRD_NAM	BIRD_SPE	#_BIRDS	WT_OZ_1	CTY_PRS	AIRPORT	LOCALE	US_INCD	ENGINE	DASH
07/10/89	1118	2			1		YQW-YYZ	ABQ	ALBUQUERQUE, NM	YES	CFM56	3
07/11/89	972	1			1		YQW-YYZ	BRU	TORONTO, CANADA	NO	JT8D	17
07/11/89	1119	1			1			BRU	BRUSSELS, BELGIUM	NO	CFM56	3
07/12/89	973	1			1			DJB	DUBLIN, IRELAND	NO	JT8D	9A
07/12/89	974	1			1		YPR-YZP	YZF	SANDSPIT, CANADA	NO	JT8D	9A
07/12/89	975	2			1		-DHA XFO		DHAHRAN, SAUDI ARABIA	NO	JT8D	17
07/13/89	976	1	HERRING GULL		14N14	1	40. YZF-YYC YZF		YELLOWKNIFE, CANADA	NO	JT8D	9A
07/13/89	977	2			1		YEG-YVR	DEL	YANCOUVER, CANADA	NO	JT8D	17A
07/15/89	978	2			1			LHE	DELHI, INDIA	NO	CFM56	3
07/15/89	1400	1			1			JRH	LAHORE, PAKISTAN	NO	JT8D	17
07/16/89	1180	1			1			JRH	JORHAT, INDIA	NO	JT8D	15A
07/17/89	979	2	BLACK KITE		3K28	1	28. LHR-LYS	LYS	LYON, FRANCE	YES	JT8D	9A
07/17/89	980	2	WESTERN MEADOWLARK		64Z68	1	4.	XUS	TAMPA, FL	YES	JT8D	9A
07/17/89	1440	1	SPARROW*		2R15	1	4. LXS-ATH	TPA	LEMNOS, GREECE	NO	CFM56	3
07/18/89	995	2	COMMON CUCKOO			1	-PUS XFO		PUSAN, KOREA	NO	CFM56	3
07/18/89	1120	2			1		BOH-FAO	BOH	BOURNOUTH, ENGLAND	NO	CFM56	3
07/18/89	1121	1			1			DUS	DUSSELDORF, GERMANY	NO	CFM56	3
07/18/89	1122	1			1			FSC	FIGARI, FRANCE	NO	CFM56	3
07/18/89	1371	1			1			PAT	PATNA, INDIA	NO	JT8D	9A
07/18/89	1371	1			1			PAT	PATNA, INDIA	NO	JT8D	9A
07/19/89	1335	2			1			BOH	BOMBAY, INDIA	NO	JT8D	9A
07/19/89	1382	1	SANDPIPERS*			1	YEG-YVR	YVR	HAMBURG, GERMANY	NO	CFM56	3
07/20/89	981	2			1			AMS	VANCOUVER, CANADA	NO	CFM56	3
07/20/89	1436	1			1		-IND	XUS	AMSTERDAM, NETHERLANDS	NO	CFM56	3
07/21/89	1123	1			1			CDG	INDIANAPOLIS, IN	YES	CFM56	3
07/22/89	1352	1			1			CJB	PARIS-DE GAULLE, FRANCE	NO	JT8D	9A
07/22/89	1356	1	VULTURE*			1		PSA	COIMBATORE, INDIA	NO	JT8D	9A
07/22/89	1401	1			1			PSA	LAHORE, PAKISTAN	NO	CFM56	3
07/22/89	1434	1			1			WDH	PISA, ITALY	NO	CFM56	3
07/23/89	1391	1	DOVE*			1	36. -DAL	XUS	J.G. STRIDJOM, S. AFRICA	YES	CFM56	3
07/24/89	1124	1	COMMON EGRET		1152	1	YXS-YVR	YXS	DALLAS, TX	YES	CFM56	3
07/25/89	982	1			1		-DAL	XUS	DC - FL	YES	JT8D	9A
07/26/89	983	1			1			XUS	PRINCE GEORGE, CANADA	YES	CFM56	3
07/26/89	1123	2			1			XUS	DALLAS, TX	YES	CFM56	3
07/27/89	1126	2			1			XUS	LIEGE, BELGIUM	NO	CFM56	3
07/27/89	1127	2			1			XUS	ZAKINTHOS, GREECE	NO	CFM56	3
07/27/89	1127	2			1			XUS	ZAKINTHOS, GREECE	NO	CFM56	3
07/27/89	1421	1			1			XUS	WARSAW, POLAND	NO	CFM56	3
07/27/89	1425	1			1			XUS	PARADISI, GREECE	NO	CFM56	3
07/28/89	984	2			1		4. RUH-HBT	XFO	SAUDI ARABIA	NO	JT8D	15
07/28/89	985	1	CUCKOO		2R15	1	40. YUL-YOW	YUL	MONTREAL, CANADA	NO	JT8D	9A
07/28/89	1128	2	HERRING GULL		14N14	1	-SPL XFO		AMSTERDAM	NO	CFM56	3
07/28/89	1129	2			1		BNN-CGN	VCE	PALMA MALLORCA, SPAIN	NO	CFM56	3
07/28/89	1189	1			1			VCE	COLOGNE/BONN, GERMANY	NO	CFM56	3
07/28/89	1441	1	SWALLOW*			1		VCE	VENICE, ITALY	NO	JT8D	15
07/28/89	1441	1	PARTRIDGE*			1		VCE	VENICE, ITALY	NO	JT8D	15
07/29/89	1130	1	SPARROW*			1		VCE	BREMEN, GERMANY	NO	CFM56	3
07/29/89	1370	1	HAWK			1		ERI	ERIE, PA	YES	CFM56	3
07/29/89	1432	2	GULL*			1	YEV-YYC	YVC	ROCHESTER, MN	YES	JT8D	9A
07/30/89	986	1			1		ROC-PHL	PHX	CALGARY, CANADA	YES	CFM56	3
07/30/89	1131	1	HAWK*			1		ROC	PHOENIX, AZ	YES	CFM56	3
07/30/89	1132	1	BLACK-HEADED GULL		14N36	1		LIL	ROCHESTER, NY	YES	CFM56	3
07/31/89	1404	2			1			LIL	LILLE, FRANCE	NO	CFM56	3
07/31/89	1133	1			1			ASP	LONDON-HEATHROW, ENGLAND	NO	CFM56	3
07/31/89	1341	1			1			ASP	ALICE SPRINGS, AUSTRALIA	NO	CFM56	3
07/31/89	1353	1	GULL*			1		BRE	BREMEN, GERMANY	NO	CFM56	3
08/01/89	1135	1	EURASIAN KESTREL		5K27	1	8. -SEL	XFO	PARIS-DE GAULLE, FRANCE	NO	JT8D	9A
08/01/89	1426	1			1			VCE	SEUL, KOREA	NO	CFM56	3
08/01/89	1442	1	SWALLOW*			1		VCE	PATNA, INDIA	NO	JT8D	9A
08/01/89	1442	1	SWALLOW*			1		VCE	VENICE, ITALY	NO	JT8D	9A
08/02/89	1136	1			1			VCE	VENICE, ITALY	NO	JT8D	9A
08/02/89	1190	1	GULL*			1		VCE	SYDNEY, AUSTRALIA	NO	CFM56	3
08/02/89	1198	1	COMMON GULL		14N13	1	15.	FNT	DAYTON, OH	YES	JT8D	9
08/02/89	1206	1			1			XUS	FLINT, MI	YES	JT8D	9
08/02/89	1429	1			1			IXZ	CHICAGO, IL	YES	JT8D	9
08/02/89	1429	2			1			IXZ	PORT BLAIR, INDIA	NO	JT8D	15A
08/03/89	987	2	COMMON BUZZARD		3K180	1	32. TXL-DUS	DUS	DUSSELDORF, GERMANY	NO	JT8D	15A

DATA SOURCES: ENGINE MANUFACTURER OR ICAO

DATE	EVT#	ENG_POS	DNG_CODE	SEVERITY	POW_LOSS	MAX_VIBE	THROTTLE	IFSD	REMARKS
07/10/89	1118	2	A,C	3	NONE	3.0		NO	3 F BLS BENT
07/11/89	972	2	A,H	3	NONE			NO	4 SHINGLED F BLS
07/11/89	1119	2	A,G	3	NONE			NO	EXTENSIVE ENG DAM, GOUGING OF F BLS
07/12/89	973	2		2	NONE			NO	FOUND ON GRD INSPEC
07/12/89	974	2		2	NONE			NO	2ND+6TH STG BLADES NICKED
07/12/89	975	2	A,D,K	1	NONE			NO	
07/12/89	976	2		1	NONE			NO	
07/13/89	977	2		1	NONE			NO	
07/15/89	978	2		1	NONE			NO	
07/15/89	1400	2	A,Q	4				NO	7 FAN BLADES DAMAGED
07/16/89	1180	1	A,C,G,I	1	NONE			NO	BROKEN PIECE OF F BLD FOUND IN EXIT CASE
07/17/89	979	2	A,H	3	NONE			NO	3 SHINGLED F BLS, FOUND ON GRD INSPEC
07/17/89	980	2		1				NO	DOOR
07/17/89	1640	2	A,Q	4				NO	EXTENSIVE GUIDE VANE DAM, 2 BLS TRVSFRA
07/18/89	995	2	A,I,K	1				NO	FOUND ON GRD INSPEC, 4 F BLS DAMAGED
07/18/89	1120	2	A,B,H	3				NO	DOOR
07/18/89	1121	2		3				NO	
07/18/89	1122	2		3				NO	
07/18/89	1371	2		3				NO	
07/18/89	1451	2	A,Q	4				NO	
07/18/89	1335	2		4				NO	
07/19/89	1382	2	A,Q	4				NO	
07/20/89	981	2		4				NO	
07/20/89	1436	2		4				NO	55 DEAD BIRDS ON RUNWAY
07/21/89	1123	2		4				NO	FOUND ON GRD INSPEC
07/22/89	1352	2		4				NO	
07/22/89	1356	2	A,Q	4				NO	5 FAN BLADES DAMAGED
07/22/89	1401	2		4				NO	
07/23/89	1374	2		4				NO	
07/23/89	1391	2		4				NO	
07/24/89	1124	2	A,C	3				NO	FOUND GRD INSPEC, SEVERAL DENTED F BLS
07/25/89	982	2	A,C	3				NO	NICKS ON F BLS
07/26/89	983	2		3				YES	DOOR, AM EVENT
07/26/89	1125	2		3				NO	FOUND ON GRD INSPEC
07/27/89	1126	2		3				NO	
07/27/89	1127	2		3				NO	
07/27/89	1127	2		3				NO	
07/27/89	1127	2		3				NO	
07/27/89	1421	2		3				NO	
07/27/89	1425	2		3				NO	
07/28/89	984	2	A,I	3				NO	DENT AND LOOSE RIVETS IN MACELLE LIP
07/28/89	985	2	A,F,I	3				NO	EMERGENCY DECLARED
07/28/89	1128	2	A,H	3				NO	4 F BLS SHINGLED
07/28/89	1129	2	A,B,H	3				NO	FOUND ON GRD INSPEC, 6 F BLS DAMAGED
07/28/89	1180	2		3				NO	
07/28/89	1441	2		3				NO	
07/28/89	1441	2		3				NO	
07/28/89	1441	2		3				NO	
07/29/89	1130	2	A,Q	4				NO	
07/29/89	1370	2		4				NO	
07/29/89	1432	2		4				NO	
07/30/89	986	2	A,H	3				NO	3 F BLS SHINGLED
07/30/89	1131	2		3				NO	DOOR, AM EVENT
07/30/89	1132	2		3				NO	
07/30/89	1404	2		3				NO	
07/31/89	1133	2	A,B,H	3				NO	DOOR, FOUND ON GRD INSPEC
07/31/89	1134	2		3				NO	3 F BLS DAMAGED
07/31/89	1341	2		3				NO	
07/31/89	1353	2	A,B	3				NO	1 F BID LEADING EDGE DENT
08/01/89	1135	2		3				NO	
08/01/89	1426	2		3				NO	
08/01/89	1426	2		3				NO	
08/01/89	1426	2		3				NO	
08/01/89	1426	2		3				NO	
08/02/89	1136	1	A,K	1				NO	AFT STGS OF HPC HAD IMPACT DAMAGE
08/02/89	1190	1	A,D,H	1				NO	DOOR, REPLACED 1ST STG FAN ASSEMBLY
08/02/89	1198	1	A,C	1				NO	PM EVENT, 1 BENT F BLD
08/02/89	1206	1		1				NO	
08/02/89	1429	1		1				NO	
08/02/89	1429	1		1				NO	
08/03/89	987	2		2				NO	

DATA SOURCES: ENGINE MANUFACTURER OR ICAO

DATE	EVT#	ENG_POS	MFG	NO	ETIM	SIGN	EVT	AIRCRAFT	POF	ALTITUDE	SPEED	FL_RULES	LT_COMDS	WEATHER	CREW_AC	CREW_AL	BIRD_SEE
08/03/89	1443	2	89	8:25:00	NONE			300	LANDING	100	225			CLEAR	NONE	NO	ONE
08/05/89	1137	1	892023	1663	20:00:00	NONE		200	TAKEOFF	0	110			CLEAR	ATO		
08/06/89	988	2	89	20:33:00	NONE			200	LANDING	0	80			CLEAR	NONE	NO	ONE
08/06/89	1348	1	89	20:33:00	NONE			200	LANDING	0	100			CLEAR	NONE	NO	SEVERAL
08/06/89	1383	1	89	12:51:00	MULT	BIRDS		200	CLIMB	0	140			OVERCAST	NONE	YES	FLOCK
08/06/89	1444	2	1779		TRVS	FRAC		200	TAKEOFF						NONE		
08/07/89	989	2	892024		NONE			300	CLIMB	0	70			SOME CLOUDS	DIV		
08/09/89	1138	2	89	5:40:00	NONE			200	TAKEOFF						ATO		
08/09/89	1345	1	1781		MULT	BIRDS		200	LANDING	0	90			OVERCAST	NONE	NO	ONE
08/10/89	990	2	892025	6:32:00	MULT	BIRDS		300	TAKEOFF	0	+V1			CLEAR	NONE	NO	FLOCK
08/10/89	1139	2	892026	11:00:00	NONE			300	TAKEOFF	20					NONE		
08/10/89	1140	1	892027		NONE			200	LANDING	30				RAIN	NONE		ONE
08/10/89	1141	1	89	20:55:00	NONE			200	TAKEOFF	0	+V1			RAIN	NONE		FLOCK
08/10/89	1409	2	892028	11:15:00	NONE			300	TAKEOFF	0	+V1				NONE		
08/11/89	1142	2	892029		NONE			200	TAKEOFF	1000	150				NONE		
08/12/89	1143	1	89	20:00:00	NONE			200	APPROACH	0	140				ATO		
08/12/89	1392	1	1782		NONE			200	TAKEOFF						NONE		
08/13/89	991	1	892030		NONE			300	UNKNOWN						NONE		
08/13/89	1144	2	892031		NONE			300	TAKEOFF	0	-V1				NONE		
08/14/89	1145	1	892032	19:35:00	NONE			300	TAKEOFF	0	100			CLEAR	ATO	NO	ONE
08/14/89	1146	1	89		NONE			200	TAKEOFF	0					NONE		
08/14/89	1385	1	1795		NONE			300	TAKEOFF	0				CLEAR	NONE		YES
08/15/89	992	2	892033		NONE			200	LANDING	0					NONE		SEVERAL
08/15/89	1147	1	892034		NONE			300	LANDING	0	150			OVERCAST	NONE	NO	SEVERAL
08/15/89	1148	1	89	8:51:00	NONE			200	TAKEOFF	0	5				NONE		
08/15/89	1402	1	89	20:20:00	NONE			200	TAXI						NONE		
08/16/89	1396	1	892035		NONE			300	UNKNOWN						NONE		
08/18/89	1149	2	892036		NONE			300	UNKNOWN						NONE		
08/18/89	1150	1	89		NONE			100	CLIMB						NONE		
08/18/89	1369	1	892037		NONE			300	LANDING	0	120			CLEAR	NONE	NO	FLOCK
08/19/89	1151	2	89	17:08:00	MULT	BIRDS		300	TAKEOFF	0	10				NONE	NO	ONE
08/19/89	1327	1	89	18:55:00	NONE			200	TAKEOFF	50	150			CLEAR	ATO	NO	
08/19/89	1375	1	1796		NONE			200	TAKEOFF	0					NONE		
08/20/89	993	2	89	11:30:00	NONE			100	TAKEOFF	0	80			CLEAR	NONE	NO	SEVERAL
08/20/89	1405	1	89	10:55:00	NONE			300	TAKEOFF	0	115			CLEAR	NONE	NO	SEVERAL
08/23/89	1393	1	89	19:45:00	NONE			200	TAKEOFF	0					NONE		
08/23/89	1397	1	89		MULT	ENG-BIRDS		300	LANDING	0					NONE		
08/24/89	1358	1	89		MULT	ENG-BIRDS		200	LANDING	0					NONE		
08/24/89	1358	2	1797		NONE			200	LANDING	0					NONE		
08/25/89	994	1	1798		NONE			200	UNKNOWN						NONE		
08/26/89	1438	2	89	17:58:00	MULT	BIRDS		200	TAKEOFF	0	120			SOME CLOUDS	NONE		SEVERAL
08/26/89	1445	2	89	12:40:00	MULT	BIRDS		200	TAKEOFF	25	150			SOME CLOUDS	NONE		FLOCK
08/27/89	997	2	1799		NONE			200	UNKNOWN	0	145			CLEAR	NONE	NO	
08/27/89	1363	1	89	6:12:00	NONE			300	TAKEOFF						NONE		
08/28/89	1152	1	892038		NONE			200	APPROACH						NONE		
08/28/89	1326	2	892039	20:16:00	NONE			300	LANDING					CLEAR	NONE		
08/28/89	1153	1	892040	15:36:00	NONE			200	TAKEOFF	100	+V1			CLEAR	NONE		
08/29/89	1154	2	892041		NONE			300	TAKEOFF	0					NONE		
08/29/89	1155	1	1811		NONE			200	UNKNOWN						NONE		
08/29/89	1179	2	89	14:55:00	NONE			200	UNKNOWN	50	160			SOME CLOUDS	NONE		SEVERAL
08/29/89	1379	2	1800		NONE			200	APPROACH						NONE		
08/30/89	998	2	89	13:00:00	NONE			200	TAKEOFF	0	100			CLEAR	NONE	NO	ONE
08/30/89	1433	1	892042		NONE			300	UNKNOWN	0	140			OVERCAST	NONE	NO	
08/31/89	1156	2	892043		NONE			200	TAKEOFF	0					NONE		
09/01/89	1157	1	89	11:57:00	NONE			200	TAKEOFF	20	150			CLEAR	NONE	YES	SEVERAL
09/01/89	1389	2	89		NONE			300	UNKNOWN	10	132			CLEAR	NONE		SEVERAL
09/01/89	1395	2	89		NONE			200	TAKEOFF	0					NONE		
09/01/89	1439	1	892045		NONE			100	LANDING	0					NONE		
09/03/89	1159	2	892046		MULT	BIRDS		300	TAKEOFF	0	+V1			CLEAR	ATB		
09/03/89	1355	1	89		NONE			200	UNKNOWN	20	150				NONE		
09/04/89	1160	2	892046		NONE			200	UNKNOWN	10	132			CLEAR	NONE		
09/04/89	1407	2	89	17:26:00	NONE			200	LANDING	0					NONE		
09/05/89	999	1	1804		ENG			200	TAKEOFF	0					NONE		
09/05/89	1000	2	1801	17:30:00	MULT	ENG		200	TAKEOFF	0					NONE		
09/05/89	1416	1	89	17:22:00	NONE			200	LANDING	0	100			CLEAR	NONE		FLOCK
09/06/89	1001	2	1802		NONE			200	TAKEOFF						NONE		

DATA SOURCES: ENGINE MANUFACTURER OR ICAO

EDATE	EVT#	ENG	POS	BIRD	NAM	BIRD	SPE	#	BIRDS	WT	OZ	1	CTY	PRS	AIRPORT	LOCALE	US	INCID	ENGINE	DASH
08/03/89	1443	2		SWALLOW*					1				YUL-YVR		VCE	VENICE, ITALY	NO		CFM56	3
08/03/89	1137	1							1						ORY	PARIS, FRANCE	NO		CFM56	17
08/06/89	988	1		BUZZARD*					1						YUL	MONTREAL, CANADA	NO		JT8D	
08/06/89	1383	2		SWALLOW*					1						YUL	CHANDIGARH, INDIA	NO		JT8D	
08/06/89	1444	2							*						HAM	HAMBURG, GERMANY	NO		JT8D	
08/07/89	989	2							1						BUL	VENICE, ITALY	NO		JT8D	15
08/07/89	1138	2							1						STR	BANJUL, GAMBIA	NO		CFM56	
08/09/89	1345	1		SWALLOW*					*						CCU	STUTTGART, GERMANY	NO		JT8D	
08/10/89	990	2		GULL*					*						YYJ	CALCUTTA, INDIA	NO		JT8D	9A
08/10/89	1139	2		RING-BILLED GULL					*						YVR	VICTORIA, CANADA	NO		CFM56	
08/10/89	1140	1		BLACK-HEADED GULL					1						HAM	HAMBURG, GERMANY	NO		CFM56	3
08/10/89	1141	1		EURASIAN KESTREL					1						AMS	AMSTERDAM, NETHERLANDS	YES		CFM56	3
08/10/89	1409	2							1						DTW	DETROIT, MI	NO		CFM56	3
08/11/89	1142	1							1						LPL	LIVERPOOL, ENGLAND	NO		JT8D	3
08/12/89	1143	1							1						VCE	VENICE, ITALY	NO		CFM56	3
08/12/89	1392	1		ROCK DOVE					1						MUC	MUNICH, GERMANY	NO		CFM56	3
08/13/89	991	1							1						TNG	JODHPUR, INDIA	NO		JT8D	15
08/13/89	1144	2							1						BCN	TANGIER, MOROCCO	NO		CFM56	3
08/14/89	1145	1							1						XFO	DALLAS, TX	YES		CFM56	3
08/14/89	1146	1							1						AMS	AMSTERDAM, NETHERLANDS	NO		CFM56	3
08/14/89	1385	1							1						ATH	ATHENS, GREECE	NO		CFM56	3
08/15/89	992	2		BLACK-HEADED GULL					1						YVR	HANOVER, GERMANY	NO		JT8D	9A
08/15/89	1147	1							1						ZF	NORMAN WELLS, CANADA	NO		CFM56	3
08/15/89	1148	1							1						VIE	VIENNA, AUSTRIA	NO		CFM56	3
08/15/89	1402	1							1						ORF	GOTENBURG, SWEDEN	YES		CFM56	3
08/16/89	1396	1							1						GOT	KHAIJURAH, INDIA	NO		JT8D	3
08/18/89	1149	2		MOURNING DOVE					1						VAKJ	CO - AZ, TX	YES		CFM56	3
08/18/89	1150	1							1						XUS	DALLAS, TX	YES		CFM56	3
08/18/89	1369	1							1						AE	ANNABA, ALGERIA	YES		JT8D	3
08/19/89	1151	1		SWALLOW*					1						DLH	DULUTH, MN	YES		CFM56	3
08/19/89	1327	2							1						AYT	ANTALYA, TURKEY	NO		CFM56	3
08/19/89	1375	1							1						FRA	FRANKFURT, GERMANY	NO		CFM56	3
08/20/89	993	2		COMMON WOOD PIGEON					1						XFO	CANADA	NO		CFM56	9A
08/20/89	1405	1							1						LIL	LILLE, FRANCE	NO		JT8D	3
08/23/89	1303	1		QUAIL*					*						KHI	KARACHI, PAKISTAN	NO		CFM56	3
08/23/89	1307	1		QUAIL*					*						VAKJ	KHAIJURAH, INDIA	NO		JT8D	3
08/24/89	1358	2		GULL*					1						LEGE	COSTA BRAVA, SPAIN	NO		CFM56	3
08/25/89	994	1							1						LEG	COSTA BRAVA, SPAIN	NO		CFM56	3
08/26/89	996	2		MAWK*					*						XFO	MONTREAL, CANADA	NO		JT8D	9A
08/26/89	1438	2		SWALLOW*					*						SVO	SHEREMETYEVO, SOVIET UNION	NO		JT8D	9A
08/26/89	1445	2							*						VCE	VENICE, ITALY	NO		JT8D	9A
08/27/89	997	2							1						XFO	CANADA, GERMANY	NO		JT8D	9A
08/27/89	1363	1							1						DUS	DUESSELDORF, GERMANY	YES		CFM56	3
08/28/89	1132	1		RED-LEGGED PARTRIDGE					1						XUS	CHICAGO, IL	NO		CFM56	3
08/28/89	1326	2							1						LEAM	ALMERIA, SPAIN	NO		CFM56	3
08/29/89	1153	2		SPARROW*					1						DUS	DUESSELDORF, GERMANY	NO		CFM56	3
08/29/89	1154	2							1						CLE	CLEVELAND, OH	YES		CFM56	3
08/29/89	1155	1							1						XFO	AMSTERDAM, NETHERLANDS	NO		CFM56	17
08/29/89	1179	2		HOUSE MARTIN					1						-OKA	JAPAN	NO		JT8D	17
08/29/89	1379	2							1						XFO	LONDON-GATWICK, ENGLAND	NO		JT8D	17
08/30/89	998	2		SPARROW*					1						LGM	CANADA	NO		JT8D	17
08/30/89	1433	1							1						XFO	TREVISO, ITALY	NO		JT8D	3
08/30/89	1156	2							1						TSF	AMSTRDAM, NETHERLANDS	NO		CFM56	3
09/01/89	1157	1							1						XFO	DUBLIN, IRELAND	NO		CFM56	3
09/01/89	1389	2							1						IAH	HOUSTON, TX	YES		CFM56	3
09/01/89	1395	2							1						CPH	COPENHAGEN, DENMARK	NO		JT8D	15
09/01/89	1439	1							1						SVG	STAVANGER, NORWAY	NO		JT8D	15
09/03/89	1355	1		YELLOW-BREADED CHAT					*						PVD	PROVIDENCE, RI	YES		CFM56	3
09/03/89	1355	1							1						MDW	CHICAGO, IL	YES		CFM56	3
09/04/89	1160	2							1						XUS	DALLAS, TX	YES		CFM56	3
09/04/89	1407	2							1						-DAL	LISBON, PORTUGAL	NO		JT8D	78
09/05/89	999	2							1						HOU	HOUSTON, TX	YES		JT8D	78
09/05/89	999	2							1						ORD	HOUSTON, TX	YES		JT8D	15
09/05/89	1000	2							1						XFO	NIGERIA	NO		JT8D	15
09/05/89	1416	1		DUCK*					*						LENG	MALAGA, SPAIN	NO		JT8D	9A
09/06/89	1001	2							1						YYC	CALGARY, CANADA	NO		JT8D	9A

DATA SOURCES: ENGINE MANUFACTURER OR ICAO

EDATE	EVT#	ENG_POS	DWG_CODE	SEVERITY	POW_LOSS	MAX_VIBE_THROTTLE	IFSD	REMARKS
08/03/89	1443	2		0	NONE		NO	3 F BLDs BENT
08/05/89	1737	1	A,C	3	COMPRESSOR		NO	ENG RECOVERED IMMEDIATELY FROM STALL
08/06/89	988	1		0			NO	
08/06/89	1348	2		0			NO	
08/06/89	1383	2		0			NO	
08/06/89	1444	2		0		YES	NO	3 FBLDS BENT, 4 FBLD TIPS WERE CUT OFF
08/07/89	989	1	A,C,I,X	2			NO	11 F BLDs DAMAGED, 13 F OGV'S LE NICKS
08/08/89	1138	2	A,B,G	0			NO	
08/09/89	1345	2		0			NO	
08/10/89	990	1	A,K	0	NONE		NO	MINOR HPC BLADE IMPACT DAMAGE
08/10/89	1139	2		1	NONE		NO	ODOR
08/10/89	1140	1		0	NONE		NO	
08/10/89	1141	0		0	NONE		NO	MULT AC STRIKES
08/10/89	1409	1		0	NONE		NO	
08/11/89	1142	2		0	NONE		NO	
08/12/89	1143	1	A,Q	4			NO	
08/12/89	1392	1		0			EPR	
08/13/89	991	1		3	NONE		NO	1 F BLD SHINGLED
08/13/89	1144	2	A,H	0	NONE		NO	1 F BLD TWISTED WITH 15 DEFORMATION
08/14/89	1145	1	A,B,C	3	NONE		NO	SEVERAL F BLDs BENT
08/14/89	1146	1	A,D	2	NONE		NO	
08/14/89	1382	1		0			NO	ODOR, MULT AC STRIKES
08/15/89	992	2		0	NONE		NO	
08/15/89	1147	1		0	NONE		NO	
08/15/89	1148	1		0	NONE		NO	
08/15/89	1402	1		0			NO	FOUND ON GRD INSPEC, 2 F BLDs SHINGLED
08/16/89	1396	1	A,B,H	3	NONE		NO	ODOR
08/18/89	1149	2		0	NONE		NO	
08/18/89	1150	1	A,Q	3	NONE		NO	
08/18/89	1369	1		0	NONE		NO	
08/19/89	1151	1		0			NO	
08/19/89	1327	2		0			NO	
08/19/89	1375	2		0			NO	
08/20/89	993	2		0			NO	
08/20/89	1403	1	A,Q	4	NONE		NO	FOUND ON GRD INSPEC
08/23/89	1332	1	A,Q	4			NO	6 FAN BLADES DAMAGED
08/23/89	1337	1		0			NO	CONSIDERABLE FAN DAMAGE, DEBRIS IN CORE
08/23/89	1371	1	A,Q	4			NO	
08/24/89	1358	1		0			NO	FOUND ON GRD INSPEC
08/24/89	1358	2		0	NONE		NO	
08/25/89	994	1		0			NO	
08/26/89	996	2		0			NO	
08/26/89	1431	2		0			NO	
08/26/89	1432	2		0			NO	
08/27/89	997	1	A,C	3	NONE		NO	2 F BLDs BENT, FOUND ON GRD INSPEC
08/27/89	1363	1	A,Q	3			NO	2 F BLDs SHINGLED, 1 F BLD TIP BENT .5IN
08/28/89	1152	1	A,C,H	3	NONE		NO	VIBES INCREASED THEN RETURNED TO NORMAL
08/28/89	1326	1	A,L	3	NONE		NO	1 STG F BLD ASSEMBLY CHANGED
08/29/89	1153	1	A,H	3	NONE	3.9	NO	FOUND ON GRD INSPEC
08/29/89	1154	1		0	NONE		NO	FOUND ON GRD INSPEC, 2 F BLDs DAMAGED
08/29/89	1155	1	A,D	2			NO	
08/29/89	1179	2		0			NO	
08/29/89	1379	2		0	NONE		NO	ENG REM, 11 HPC BLDs IMPACT DAMAGE
08/30/89	998	2		0			NO	ODOR, FOUND ON GRD INSPEC
08/30/89	1433	1		0			NO	
08/31/89	1156	1		0	NONE		NO	
09/01/89	1157	1	A,C,H	0	NONE		NO	
09/01/89	1380	2		0			NO	
09/01/89	1380	2		0			NO	
09/01/89	1395	1	A,D,K	0			NO	
09/01/89	1429	1		0			NO	
09/03/89	1159	2		0			NO	
09/03/89	1355	1		0			NO	
09/04/89	1160	2		0	NONE		NO	
09/04/89	1407	1		0	NONE		NO	
09/05/89	999	2	A	0	NONE		NO	FAN CHANGED
09/05/89	1000	2		0	NONE		NO	
09/05/89	1416	1		4			NO	ODOR, NACELLE DAMAGE, 6 RIVETS SHEERED
09/06/89	1001	2	A,L	3	NONE		NO	

DATA SOURCES: ENGINE MANUFACTURER OR ICAO

EDATE	EVT#	ENG POS	MFG NO	ETINE	STGN	EVT	AIRCRAFT	POF	ALTITUDE	SPEED	FL RULES	LT_CONDS	WEATHER	CREW_AC	CREW_AL	BIRD_SEE
09/06/89	1161	2	892047		NONE		300	UNKNOWN						NONE		
09/06/89	1372	1	89	8:50:00	NONE		200	TAKEOFF		0 80				NONE		
09/07/89	1357	1	89	18:55:00	NONE		200	TAKEOFF		0 95				NONE		
09/08/89	1002	2	1805		NONE		200	TAKEOFF		0 105				ATO		YES
09/09/89	1162	1	892048		NONE		500	UNKNOWN						NONE		
09/09/89	1384	2	89	18:14:00	BIRDS			TAKEOFF		0 120			CLEAR	NONE	NO	SEVERAL
09/10/89	1336	1	89	9:45:00	NONE		200	LANDING		0 80				NONE	NO	FLOCK
09/10/89	1437	1	89	15:23:00	MULT	ENG-BIRDS	200	TAKEOFF		10 135			SOME CLOUDS	OTHER		FLOCK
09/10/89	1437	2	89	15:23:00	MULT	ENG-BIRDS	200	TAKEOFF		10 135			CLEAR	ATO	NO	NO
09/11/89	1003	2	1806	6:05:00	NONE		200	TAKEOFF		0 140			SOME CLOUDS	NONE	NO	SEVERAL
09/11/89	1331	2	89	9:12:00	MULT	BIRDS	200	TAKEOFF		0 132			CLEAR	NONE		FLOCK
09/11/89	1408	1	89	18:25:00	MULT	BIRDS	200	LANDING		250 157				NONE		
09/12/89	1004	1	1807		NONE		200	TAKEOFF						NONE		
09/12/89	1414	2	89	21:55:00	NONE		200	TAKEOFF		0 126			CLEAR	NONE	NO	ONE
09/13/89	1163	1	892049		NONE		300	UNKNOWN						NONE		
09/13/89	1328	1	89	10:35:00	MULT	BIRDS		TAKEOFF						ATO	NO	SEVERAL
09/13/89	1472	2	89		NONE		200	TAKEOFF		100 160			CLEAR	NONE	NO	SEVERAL
09/14/89	1005	1	1808		NONE		200	TAKEOFF		0 80				ATO		ONE
09/14/89	1398	2	89	15:20:00	NONE		200	LANDING		0 90			SOME CLOUDS	NONE	NO	SEVERAL
09/16/89	1447	2	89	15:27:00	NONE		200	TAKEOFF		35 120			CLEAR	NONE	YES	SEVERAL
09/17/89	1323	1	89	10:35:00	NONE		200	TAKEOFF		0 140			CLEAR	ATB	NO	SEVERAL
09/19/89	1364	1	89	15:36:00	NONE		300	LANDING		50 140			OVERCAST	NONE	NO	SEVERAL
09/20/89	1164	2	892050	12:00:00	NONE		300	LANDING		0 130	VFR	BRIGHT	CLEAR	NONE	NO	ONE
09/21/89	1165	1	892051		NONE		200	UNKNOWN						NONE		
09/21/89	1178	1	1813		NONE		200	UNKNOWN						NONE		
09/21/89	1348	1	89	17:00:00	NONE		200	TAKEOFF		0 100			OVERCAST	NONE	NO	ONE
09/22/89	1158	1	892044	17:12:00	NONE		300	LANDING		150 135				NONE	YES	YES
09/23/89	1376	1	89		NONE		300	LANDING		0			CLEAR	NONE	NO	ONE
09/23/89	1166	2	892052		NONE		300	LANDING		134				NONE	YES	ONE
09/23/89	1167	2	892053		NONE		300	LANDING						NONE		
09/24/89	1168	1	892054		NONE		400	UNKNOWN						NONE		
09/25/89	1332	1	89	6:34:00	NONE		200	LANDING		0 90			SOME CLOUDS	NONE	NO	ONE
09/26/89	1199	1	89	8:10:00	MULT	ENG-BIRDS	300	LANDING		0 130			CLEAR	NONE		SEVERAL
09/26/89	1769	2	892055	8:10:00	MULT	ENG-BIRDS	300	LANDING		0 130			CLEAR	NONE		SEVERAL
09/27/89	1380	1	89	9:45:00	NONE		200	CLIMB		1800 200			OVERCAST	NONE	ONE	ONE
09/28/89	1423	2	89	19:27:00	NONE		200	TAKEOFF		0 40			OVERCAST	ATO	NO	ONE
09/29/89	1170	1	892056	20:06:00	NONE		300	TAKEOFF		0 150			CLEAR	ATB	YES	YES
09/29/89	1176	1	1812		NONE		200	TAKEOFF						NONE		
09/29/89	1177	1	1807		NONE		200	TAKEOFF						ATB		NO
09/30/89	1175	2	1809		ATWRTY		200	TAKEOFF						NONE		

DATA SOURCES: ENGINE MANUFACTURER OR ICAO

DATE	EVT#	ENG POS	BIRD NAM	BIRD SPE	# BIRDS	W/ OZ 1	CTY PRS	AIRPORT	LOCALE	US INCID	ENGINE	DASH
09/06/89	1161	2	CATTLE EGRET	1135	1	16.	-CTU	XFO	CHENGDU, CHINA	NO	CFM56	3
09/06/89	1372	1	GULL*					FLN	FLORIANOPOLIS, BRAZIL	NO	JT8D	
09/07/89	1357	1						CMG	CORUMBA, BRAZIL	NO	JT8D	9A
09/08/89	1002	2					YMG-YVR	XUS	WINNIPEG, CANADA	NO	JT8D	9A
09/09/89	1162	1	LAPWING*		*		-SFO	HAM	SAN FRANCISCO, CA	YES	CFM56	3
09/09/89	1384	2	KITE*		*			BOM	HAMBURG, GERMANY	NO	JT8D	
09/10/89	1336	1	KITE*		*			GOA	BOMBAY, INDIA	NO	JT8D	
09/10/89	1437	1	GULL*		*			GOA	GENOA, ITALY	NO	JT8D	
09/10/89	1437	2	GULL*		*			GOA	GENOA, ITALY	NO	JT8D	
09/11/89	1003	2	GULL*		*		JNB-PLZ	JNB	JOHANNESBURG, S. AFRICA	NO	JT8D	9A
09/11/89	1331	2	KITE*		*			BBT	BUHAIKESHWAR, INDIA	NO	JT8D	
09/11/89	1408	1			*		YYC-LAX	YYC	LISBON, PORTUGAL	NO	JT8D	17
09/12/89	1004	1			*			LKO	CALAGARY, CANADA	NO	JT8D	
09/12/89	1414	2			*		-AMS	XFO	LUCKNOW, INDIA	NO	CFM56	3
09/13/89	1163	1	GULL*		*			STO	AMSTERDAM, NETHERLANDS	NO	JT8D	
09/13/89	1328	1			*			STO	STOCKHOLM, SWEDEN	NO	JT8D	
09/13/89	1412	2			*		YXD-YZF	YXD	LOS ANGELES, CA	YES	JT8D	9A
09/14/89	1005	1	HAUK*	3K103	1	6.7		LAX	EDMONTON, CANADA	NO	JT8D	
09/14/89	1398	2	EUROPEAN SPARROW HAWK		1			BNJ	BONN, GERMANY	NO	JT8D	
09/16/89	1447	2	HAUK*		1			TRV	TRIVANDRUM, INDIA	NO	JT8D	
09/17/89	1323	1			1			BFS	BELFAST, N. IRELAND	NO	JT8D	
09/19/89	1364	1	GULL*		1			DUS	DUESSELDORF, GERMANY	NO	CFM56	3
09/20/89	1164	2	GULL*		1			AMS	AMSTERDAM, NETHERLANDS	NO	CFM56	3
09/21/89	1165	1			1		-LTN	XFO	LUTON, ENGLAND	NO	CFM56	9A
09/21/89	1178	1			1		YMG-YVR	CCU	CANADA	NO	JT8D	
09/21/89	1346	1			1			GIG	CALCUTTA, INDIA	NO	JT8D	3
09/22/89	1158	1	BLACK VULTURE	3K55	1	48.		FRA	RIO DE JANEIRO, BRAZIL	NO	CFM56	3
09/23/89	1376	1	COMMON GULL	14N13	1	15.		EMR	FRANKFURT, GERMANY	NO	CFM56	3
09/23/89	1169	2			1			XFO	NEWARK, NJ	YES	CFM56	3
09/23/89	1167	2			1		-LGM	XFO	GERMANY	NO	CFM56	3
09/24/89	1168	1			1			BBT	LONDON, ENGLAND	NO	CFM56	3
09/25/89	1332	1			1			LTN	BUHAIKESHWAR, INDIA	NO	JT8D	3
09/26/89	1169	1			2	14.1		LGM	LUTON, ENGLAND	NO	CFM56	3
09/26/89	1169	2			1			LGM	LONDON-GATWICK, ENGLAND	NO	CFM56	3
09/27/89	1380	2	HUNGARIAN PARTRIDGE	4L85	1			PMI	PALMA MALLORECA, SPAIN	NO	JT8D	
09/28/89	1423	1	HUNGARIAN PARTRIDGE		1			NUE	MURENBERG, GERMANY	NO	JT8D	3
09/29/89	1170	1			1		YVO-YUL	YVO	VAL D'OR, CANADA	NO	CFM56	
09/29/89	1176	1			1		JAX-IAD	JAX	JACKSONVILLE, FL	YES	JT8D	7
09/29/89	1177	1			1		YUL-YYZ	YUL	MONTREAL, CANADA	NO	JT8D	9A
09/30/89	1175	2			1							

DATA SOURCES: ENGINE MANUFACTURER OR ICAO

EDATE	EV#	ENG_POS	DMG_CODE	SEVERITY	POW_LOSS	MAX_VIBE	THROTTLE	IFSD	REMARKS
09/06/89	1151	2	A,B	3	NONE			NO	1 FBLD LE SLIGHT BEND, FOUND ON GRD INSPE
09/06/89	1372	1		0					
09/07/89	1357	1		0					
09/08/89	1002	2	A,H	3	COMPRESSOR			NO	
09/08/89	1002	2	A	4	NONE			NO	FOUND ON GRD INSPEC, 2 F BLDs UNK DAMAGE
09/09/89	1062	1		0					
09/09/89	1384	2		0					
09/10/89	1336	1	A,Q	4					
09/10/89	1437	1	A,Q	4					
09/11/89	1003	2		0				NO	
09/11/89	1331	2	A,Q	4					
09/11/89	1408	1		0					
09/12/89	1004	1		0				NO	ODOR
09/12/89	1414	2		0					
09/13/89	1163	1	A,B	3	NONE			NO	FOUND ON GRD INSPEC, 2 F BLDs LE DISTORT
09/13/89	1328	1		0				YES	
09/13/89	1412	2	A,Q	4				YES	
09/14/89	1005	1		0	COMPRESSOR			VOLUNTARY	3 COMP STALLS
09/14/89	1398	0		0					
09/16/89	1277	1		0					
09/17/89	1323	1	A,Q	4					
09/19/89	1364	1		0					
09/20/89	1164	2		0	NONE			NO	ODOR
09/21/89	1165	1	A,H	3	NONE			NO	3 ACQUST C PANELS CRACKED, 3 FBLDS SHING
09/21/89	1178	1		0	NONE			NO	FOUND ON GRD INSPEC
09/21/89	1346	1		0					
09/23/89	1158	1	A,K	1	NONE	NONE		NO	ENG REM AFT FLT TO GRU, HPC DAM ALL STGS
09/24/89	1376	1		0					
09/25/89	1169	1		0	NONE			NO	
09/25/89	1167	2		0	NONE			NO	FOUND ON GRD INSPEC
09/25/89	1332	1		0	NONE			NO	FOUND ON GRD INSPEC
09/26/89	1169	1		0					
09/26/89	1380	1	A,B,H	3				NO	8 F BLDs SHINGLED+7 FBLDS LE DISTORTION
09/28/89	1251	2		0					
09/28/89	1170	1		0				YES	11 F BLDs LE DISTORTION
09/29/89	1176	1	A,B	3	NONE			NO	
09/29/89	1177	1		0	COMPRESSOR				
09/30/89	1175	2		0				NO	EXPERIENCED A BANG AND AC 'YAWED'

APPENDIX C

STATISTICAL HYPOTHESIS TESTING

Statistical analyses are based on an underlying probabilistic model of the processes that give rise to the data. For example, to provide the basis for comparing the weights of ingested birds in the United States and overseas it is necessary to hypothesize an underlying random distribution of bird weights. Statistical analyses are somewhat more sophisticated than descriptive data analyses and more care is required to ensure that the methods are appropriate for the data.

Statistical analysis is basically formalized inductive reasoning. Hypotheses about bird ingestion hazards are evaluated for consistency with the data that have been collected. Statistical analysis provides the rules for quantifying the level of consistency forming the basis for objective unbiased decisions. The process is known formally as statistical hypothesis testing and a brief outline of the procedure is presented here.

The basis of a statistical hypothesis test is the hypothesis; which is a formal statement about a relationship in the data. In comparing the weight distributions of United States ingestions versus foreign ingestions, one hypothesis is that there is no difference in the sizes of the birds ingested here versus those ingested overseas. If the data are found to be consistent with the hypothesis it is accepted; otherwise the hypothesis is rejected.

The rules for deciding whether to accept or reject the hypothesis are based on the possible errors that could be made. A type I error refers to the situation in which the hypothesis is true; however we reject the hypothesis. Alternatively when we accept the hypothesis when it is not true we commit a type II error.

The goal of the statistician is to minimize the likelihood of both types of errors. Unfortunately the likelihood of a type I error is reciprocally linked to the likelihood of a type II error so that lowering the likelihood of a type I error will increase the likelihood of a type II error. Since only one error can be fully controlled it has become standard practice to control the likelihood of a Type I error; which is called the significance level of the test. The test hypothesis is chosen so that it should be accepted unless there is strong evidence that it is not true and the test is constructed to minimize the likelihood of a type II error for the given significance level over a broad range of alternatives.

The mechanics of conducting a statistical hypothesis test are implemented by calculating a test statistic. The test statistic is a function of the data that is related to the test hypothesis. It is usually constructed so that small values are consistent with the null hypothesis and large values are consistent with the alternative hypothesis. The cutoff for accepting or rejecting the null hypothesis is called the critical value and is a function of the desired significance level.

Another aspect in evaluating the efficiency of a statistical test is its ability to detect when the test hypothesis is false. This ability is called the power of the test and is defined to be the probability of rejecting the test hypothesis when it is false. Generally there are many alternatives to

the test hypothesis so that the power of the test is a function of the specific alternate hypothesis.

A variation on the statistical hypothesis test is the calculation of a confidence interval for a parameter such as the overall probability of ingestion (POI). Since there is no specific hypothesis about the POI, a confidence interval is used to describe the range of probabilities that are consistent with the data. The confidence level associated with a confidence interval corresponds to one minus the significance level of a hypothesis test and is a measure of the likelihood that the true value of the parameter (in this case the POI) is contained in the interval.